

AN EMPIRICAL INVESTIGATION OF SOME ECONOMIC CONSEQUENCES
OF FASB STATEMENT NO. 8: FOREIGN CURRENCY TRANSLATION

BY
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In October 1975, the Financial Accounting Standards Board (FASB) released Statement No. 8, "Accounting for the Translation of Foreign Currency Transactions and Foreign Currency Financial Statements," the implementation of which has been widely criticized. Critics in the popular press claimed that FASB No. 8 causes increased volatility in reported earnings and does not reflect the economic risk of exchange rate fluctuations to a firm. Hence investors are supposedly misled, resulting in lowered security prices and suboptimal decisions by managers made solely to counteract the effects of FASB No. 8 on earnings.

The research objective of this dissertation was to investigate the effects of FASB No. 8 on the security price behavior and the financial structure of multinationals. Descriptive statistics on the translation methods, reported exchange adjustments, and the variance of reported earnings were also provided for our sample firms.

The effects of FASB No. 8 on security return distributions were determined by both multivariate cross-sectional comparisons of relative risk equalized total returns between multinational (test) and domestic firms, and by time-series tests on average residual returns. The effect on financial structure was determined by cross-sectional and time-series tests on four balance sheet accounts (longterm debt, inventory, fixed assets, current liability) and two income statement accounts (revenue, income), each deflated by total assets.

The sample for statistical tests consisted of 281 New York Stock Exchange (NYSE) multinationals with return data available from 1/1969-12/1977 on the CRSP tape. Six different grouping schemes were used for the test firms. Firms were primarily grouped in each period by the translation method (current/noncurrent, hybrid, monetary/nonmonetary). Additional variables used for partitioning were "change in exchange adjustment" (increase, decrease), magnitude of foreign revenues (large, small), and "sign of exchange adjustment" (positive, negative) in grouping schemes 2, 3, and 4 respectively. In grouping scheme 5, portfolios were formed by the translation method used by firms in the pre-FASB No. 8 period. Grouping scheme 6 consisted of "Action" firms and "No Action" firms. Questionnaire data were used to form the group of "Action" firms in which managements were judged to be taking action to neutralize the effects of FASB No. 8 on earnings. "No Action" firms consisted of the remaining MNC. The test period consisted of 1973-1974 and 1975-1976 as the pre and post-FASB No. 8 periods respectively. Only firms that had minimum exchange adjustments of 1% of net income were included in the tests in any particular year.

In the cross-sectional tests the vector of mean returns was not significantly different for the test and control (domestic) firms in any period for any of the grouping schemes. The covariance matrices of test and control firms were significantly different in all periods when firms were grouped by the magnitude of foreign revenues. For other grouping schemes, the differences in covariances were considered insignificant. In the time-series tests, the means of the average residuals were not significantly different over time for one of the groups (scheme 5). For the other groups (schemes 1-4), the residuals were significantly different in 1976 from 1975 and fairly significantly different in 1975 from 1974 but there was no difference between the residuals of 1974 and 1976. No explanation was provided for the conflicting results. The overall conclusion was that in general, there had not been any statistically significant effects of FASB No. 8 on the security returns of multinationals. An additional conclusion was that an uncontrolled variable, associated with the magnitude of foreign revenues, was systematically affecting the variance of returns. The tests on financial structure revealed that the balance sheet structure of Action and domestic firms was significantly different in the post-FASB No. 8 period prompting the conclusion that FASB No. 8 had an effect on the financial structure of selected firms.

CHAPTER I INTRODUCTION

In recent years, the involvement of many U.S. corporations in foreign operations has expanded substantially. With the advent of floating foreign currency exchange rates in 1971, reporting the results of foreign operations in consolidated financial statements had become an increasingly important task for multinational corporations (MNC, hereafter).

Pakkala (1975), reported that by the early 1970's MNC were using an array of methods to "translate"--restate arithmetically in terms of one base currency--the foreign currency statements of international subsidiaries into U.S. dollars. To reduce the diversity of methods, the Financial Accounting Standards Board, issued in October 1975, Statement of Financial Accounting Standards No. 8. "Accounting for the Translation of Foreign Currency Transactions and Foreign Currency Financial Statements" (FASB No. 8, hereafter).

Corporate leaders, financial analysts and academicians have criticized FASB No. 8 in the financial press.¹ Critics have claimed that its effects on earnings are misleading and that it will result in several adverse economic consequences, including

- (1) lowered stock prices
- (2) decisions by management made solely to counteract the effect of FASB No. 8 on earnings
- (3) adverse impact on the predictability of earnings.

The actual effects of the pronouncement are of concern to management, investors and to policy making bodies like the Financial Accounting Standards Board (FASB, hereafter). The FASB has called for research on the economic consequences of existing and proposed standards.

Objectives of Research

The purpose of this research is an empirical investigation of some economic consequences of FASB No. 8. Specifically, the purpose is to study, for firms affected by FASB No. 8,

- (1) the association of the announcement or implementation of FASB No. 8 and security price behavior--the "effect" on security prices.
- (2) the effect on balance sheet structure; and
- (3) provide descriptive statistics about the variability of income and the accounting method used for translation for the period 1973-1977.

The results of this research should provide information about some economic consequences that the FASB may find useful in monitoring the implementation and reviewing the effectiveness of FASB No. 8. Also, if no economic consequences are found, the results should settle the controversy surrounding FASB No. 8.

The remaining parts of this dissertation consist of a consideration in the next chapter of some conceptual issues in foreign currency translation, of the possible effects of FASB No. 8 on security returns and on the structure of the balance sheet of MNC. The broad hypotheses

are developed and the research design is presented in Chapter III and the results are provided and discussed in Chapter IV. The conclusions and limitations of this study are discussed in Chapter V.

Note

1. See, for example Revzin (1976), Shank (1976) and Snyder (1977).

CHAPTER II CONCEPTUAL ISSUES IN FOREIGN CURRENCY TRANSLATIONS

Fluctuations in Exchange Rates

Prior to 1971, the exchange rates between various currencies were fixed under the then prevailing International Monetary System. The fixed exchange rate system operated under the Bretton Woods treaty reached in 1944. The system called for stable exchange rates that were "pegged" to par values. Countries could change the par value of their currency if economic considerations warranted making an adjustment, but normally countries tried to maintain the par value as long as possible. The U.S. dollar was very important in that system as it was a reserve currency and convertible to gold at \$35 per ounce. As a result, until the late sixties, exchange rates changed only rarely, and then foreign currencies only devalued against the U.S. dollar.

The Deutsch mark appreciated against the dollar for the first time in 1969. In 1970, the Canadian dollar was allowed to "float" and it also appreciated against the U.S. dollar. In 1971, economic pressure led to a devaluation of the U.S. dollar and the end to the Bretton Woods system as some currencies were permitted to float against each other. In August 1971, the dollar was freed from the gold standard and it was further devalued in 1973. By 1973, a floating exchange rate system was fully in existence.

In the floating system, exchange rates are determined by market forces and may change significantly every day. Giddy and Dufey (1975)

have found that under the current floating system, exchange rate changes follow a random walk. Hence, short term predictions of rate changes are not possible. To sum up, in the seventies, the U.S. dollar continued to be weak and exchange rates fluctuated continuously and unpredictably against each other.

If relative exchange rates stay fixed, MNC will not have any exchange gains (losses) and the various translation methods (discussed later) will give similar results. Under floating exchange rates, large exchange gains (losses) are possible and mostly depend on the translation method used.

Accounting and Economic Risk Defined

Some definitions are provided next. Accounting risk (exposure) is defined as the possibility that published financial reports will show an impact from changes in exchange rates. Those assets and liabilities that are translated at the rate which is in effect on the date of the financial statement (the current rate) are said to bear accounting risk, because currency movements will change the dollar value of those assets and liabilities.

Economic exposure is defined as any and all effects of the rate change that will affect the cash flow stream (and the long term survival) of the MNC. There is no general agreement on the precise definition and methods of measurement of the economic risk faced by a firm when exchange rates change.¹ But it is clear that economic risk may be different from the accounting risk faced by a firm for a given exchange rate change.

Consider an example adapted from Shank (1976). Suppose a Brazilian subsidiary of a U.S. corporation is in a capital-intensive, high growth business. It reports good earnings each year, but it always absorbs more

capital than it generates. It raises the needed capital and buys and sells in Brazil. It has no direct dealings with the parent and pays no dividends. Suppose further that Brazil's cruzeiro is devaluing in relation to the dollar. The debt repayment thus involves no foreign currency translation risk. Under the accounting methods that translate debt at current rates, the subsidiary's cruzeiro debt is exposed in an accounting sense. If the subsidiary were to borrow dollars instead of cruzeiros, there would be no accounting exposure. There would, however, be economic exposure because the subsidiary may have to pay different amounts of the cruzeiros it generated to buy dollars for the repayment of the debt.

The fact that accounting risk is usually different from economic risk has implications for measuring the economic impact of FASB No. 8. These problems are discussed later, in the section dealing with the effects of FASB No. 8 on management.

Reporting Methods for Foreign Currency Translations

The controversy in the literature has been basically about two questions. First, which accounting method should be used for translating foreign currency statements, and second, how should the resulting translation gain or loss be reported? The principal methods suggested in the literature for the translation of foreign subsidiary statements are (1) the current/noncurrent method (C), (2) monetary/nonmonetary method (M), (3) the current rate method (CR) and (4) a modification of the monetary/nonmonetary method (called the hybrid method (H) here). Since the choice of the method for translation is not the focus of this research, the various normative papers dealing with which translation method should be used are not discussed here.² A description of the various methods follows:

Current/noncurrent Method (C). According to this method, all current assets and current liabilities of foreign subsidiaries are translated at the current rate (closing spot rate). All other asset, liability, and equity accounts are translated at the exchange rate in effect when those accounts were first booked, i.e., the historical rate. In the income statement, all revenue and expense items are translated at the rates in effect when those items were accrued (or average rates) except for revenue and expense items relating to noncurrent assets and liabilities, which should be translated at the same rates as the corresponding balance sheet items.

The current/noncurrent method was first accepted by the AICPA in 1931 and was recommended in the Accounting Research Bulletin No. 43, Chapter 12. The assumption implicit in this method is that short-term items are "exposed," whereas fixed assets and long-term debts are not.

Monetary/nonmonetary Method (M) was first suggested by Hepworth (1956). In 1960, the National Association of Accountants recommended this method in its report No. 36. Under this method, monetary assets and liabilities are translated at the current exchange rate. Nonmonetary (physical) assets are assumed to be free from exchange risk and are translated at their historical rates. All income statement items are translated at average exchange rates (usually monthly averages), except for items relating to nonmonetary assets and liabilities, which are translated at historical rates.

Hybrid Method (H). One objection raised against the monetary/nonmonetary method has been with respect to the translation of inventories at historical rates. Some companies feel that inventories, which are steadily turned over, are as exposed as other monetary items. This gave rise to the hybrid method, which is essentially the monetary/nonmonetary method with inventories translated at current rates as well.

Current Rate Method (CR). All assets, liabilities, revenues and expenses are translated at current rates; under this method. Only owners' equity accounts are translated at historical rates, hence only the net equity of each subsidiary is assumed to be exposed. This method, though widely used by European firms, was not used by many firms in the U.S.A. While the monetary/nonmonetary and current/noncurrent methods emphasize the parent company's viewpoint, the current rate method takes the viewpoint of the foreign subsidiary. In the current rate method, as all accounts are translated using one rate (the current rate), the relative magnitudes of the various accounts in the dollar-statements are the same as in the original, foreign-currency statements. The relative magnitudes of the various accounts in the original statements are not maintained in the translated statements, when other translation methods are used.

Temporal Method. Leonard Lorensen (1972), in Accounting Research Study No. 12, put forth the temporal method of translation. Under this method, assets and liabilities are classified by their basic temporality. Items which are carried at present or future prices are translated at the current rate. Those assets and liabilities that are carried at their historical costs are translated at historical exchange rates. The exchange rate appropriate to translation of inventory depends on its valuation method. Inventory carried at cost is translated at historical rates, whereas if inventory is carried at market or net realizable value or replacement cost, it is translated at current rates. If lower of cost-or-market is used, translated historical cost should be compared with translated market.

Under current generally accepted accounting rules with historical cost accounting, the temporal method is essentially the same as the monetary/nonmonetary method. There are some minor differences between the two

methods--inventory carried at net realizable value or replacement cost and marketable securities carried at cost--which possibly could be important. However, for all practical purposes, the two methods are treated as equivalent and no distinction is made between them in this research.

FASB No. 1. In December 1973, the FASB issued Statement of Financial Accounting Standards No. 1, "Disclosure of Foreign Currency Translation Information." FASB No. 1 did not establish any new accounting standards, but required extensive disclosures of the translation methods used and disposition of exchange adjustments by affected firms. Broadly, the statement required disclosure of

- 1) the accounting method used to translate income statement and balance sheet accounts and the time of recognition of gain/loss on forward exchange contracts;
- 2) the aggregate amount of exchange adjustment
 - (a) originating in the period, and the part thereof included in income or deferred;
 - (b) included in income (regardless of when originated);
- 3) the aggregate amount of deferred exchange adjustments;
- 4) the change in value of long-term debt and receivables translated at historical rates, if they were to be translated at current rates;
- 5) the unrecognized gain/loss on unperformed forward exchange contracts.

FASB No. 1 was effective for firms with fiscal years ended in December 1973. The fact that the information required under FASB No. 1 was inadequately disclosed can be seen from the annual survey of 600 companies conducted by the AICPA (1973). In 1972, only 80 firms disclosed the dollar

value of the translation adjustments. While 164 other firms disclosed their translation policies, they did not disclose the gain/loss from translation.

FASB No. 8. On December 31, 1974, the FASB issued an exposure draft, "Accounting for the Translation of Foreign Currency Transactions and Foreign Currency Financial Statements." This exposure draft was finalized as the FASB Statement No. 8 in October 1975. FASB No. 8 requires a uniform method of translating foreign currency transactions and financial statements. The rules apply to financial statements of foreign affiliates of U.S. companies which are either consolidated in U.S. statements or are accounted for by the equity method. The major provisions of FASB No. 8 are

- (a) Foreign currency transactions are to be recorded at the rate in effect on the transaction date.
- (b) Financial statements are to be translated using the "temporal" method.
- (c) With the exception of gains (losses) on certain forward exchange contracts, exchange gains and losses are to be reflected in operations for the period in which the exchange rate changes.
- (d) The aggregate exchange gain (loss) included in income for the period is to be disclosed.
- (e) The statement is effective for fiscal years beginning on or after January 1, 1976.

In this research, the translation method required under FASB No. 8 (temporal method) is assumed to be equivalent to the monetary/nonmonetary method. The three main translation methods used by U.S. companies are compared below.

Comparison of Main Translation Methods. The exchange rates used to translate the various accounts in the monetary/nonmonetary, current/noncurrent and hybrid translation methods are shown in Table 1.

Table 1

Comparison of Exchange Rates Used in Three Translation Methods

<u>Account</u>	<u>Current/ Noncurrent</u>	<u>Monetary/ Nonmonetary</u>	<u>Hybrid</u>
Inventory	CR ^a	HR ^b	CR
Other Current Assets	CR	CR	CR
Long Term Assets	HR	HR	HR
Current Liabilities	CR	CR	CR
Long Term Debt (LTD)	HR	CR	CR
Apart from common items, exposed are:	Inventory	LTD	Inventory & LTD

^aCR = Current Rate

^bHR = Historical Rate

From Table 1, it can be seen that inventory and long-term debt are the only two accounts that are affected by the different translation methods. Apart from the common items that are exposed under all three translation methods (other current assets and current liabilities), the accounts that are exposed under each method are also shown.

Pakkala (1975) gives the weight of the various accounts in a typical subsidiary balance sheet. It is shown in Table 2, with a slight change. Based on these account weights, the accounting exposed position and the corresponding effect of the devaluation or appreciation of the U.S. dollar on translation adjustment can be calculated for each of the three translation methods. Under the current/noncurrent method, the firm has an exposed net

asset position, whereas it has an exposed net liability position under the monetary/nonmonetary method. For a given exchange rate change, the translation adjustment is correspondingly opposite under the two methods.

Table 2
A Representative Balance Sheet

<u>Assets</u>		<u>Equities</u>	
Other Current Assets	28%	Current Liabilities	25%
Inventory	24%	Long Term Debt	20%
		Other	5%
Net Plant	40%		
Other Fixed Assets	8%	Owners Equity	50%
Total Assets	100%	Total Equities	100%

Source: Pakkala (1975)

Under the hybrid method, the exposed position is in between that of the other two accounting methods. The implications of the three translation methods for the hypothetical firm are summarized in Table 3.

Table 3
Comparison of Accounting Exposure in Various Translation Methods

<u>Accounting Method</u>	<u>Exposed Position</u>	<u>Effect of \$</u>	
		<u>Appreciation</u>	<u>Devaluation</u>
Current/ Noncurrent	27% (Net Assets)	Loss	Gain
Hybrid	2% (Net Assets)	Small Loss	Small Gain
Monetary/ Nonmonetary	22% (Net Liabilities)	Gain	Loss

The impact of a change to FASB No. 8--defined as the difference in reported earnings under the new method and the earnings based on the previously used translation method--depends on the previously used translation method, the structure of the balance sheet and the change in exchange rates

that took place. The effect of a change to the monetary/nonmonetary method on the earnings of the hypothetical firm shown in Table 2 is shown in Table 4.

Table 4

Effect of Change to M/MN Method on Earnings of Hypothetical Firm

<u>Previous Accounting Method</u>	<u>Effect on Earnings Due to \$</u>	
	<u>Appreciation</u>	<u>Devaluation</u>
Current/Noncurrent	Large Increase	Large Decrease
Hybrid	Increase	Decrease
Monetary/Nonmonetary	No Change	No Change

The firms previously using the current/noncurrent method would be most affected, whereas the firms using the monetary/nonmonetary method would not be affected at all by the adoption of FASB No. 8.

Treatment of Exchange Adjustments. The second controversy concerning the choice of the reporting method deals with the treatment of the unrealized exchange adjustment (gain/loss) due to the translation of foreign currency financial statements. The treatment of realized exchange adjustments, which arises when payments or receipts are made in foreign currency, is not controversial because realized exchange adjustments are immediately included in income. Exchange adjustments due to translation can be immediately recognized in income or deferred and included in income over time. The principal alternatives are (1) to include the exchange gain/losses in income in each period (2) to defer both the gains and losses in a balance sheet reserve account and (3) to include only the losses (in excess of previously

deferred gains) in income, but defer gains. Prior to FASB No. 8, firms used one of the above three methods or a combination of all the three methods.

FASB No. 8 requires that firms include the unrealized exchange adjustment in income each period and that reserve accounts are no longer permitted. The reaction of the financial community to this requirement of the FASB is discussed in the next section.

Possible Effects of FASB No. 8

Adoption of FASB No. 8 may have effects on the behavior of security price returns and on the structure of the balance sheets of MNC for reasons that may be characterized as investor behavior and management behavior. These two reasons are discussed in detail below.

Investor Behavior. Gonedes (1978) describes investor behavior in the following way:

The distributions of future values of firms' securities define the gambles available in the capital market. These distributions are, therefore, among the ultimate objects of analysis when agents are making optimal consumption-investment decisions and, thus, when firm's securities are "priced out" in the capital market. (p. 29)

The question then is, did FASB No. 8 have any effect on market agents' assessment of distributions of returns of MNC? One advantage claimed for FASB No. 8 is consistency in accounting for foreign currency translations. Prior to FASB No. 8, firms were using three different methods or some modifications of them. This could have caused difficulties in the comparison of financial statements of firms in a meaningful way. Aside from this advantage, FASB No. 8 has been basically criticized on two points.

First, FASB No. 8 does not require providing information to measure the economic exposure of MNC. Second, the inclusion of unrealized translation adjustments in income is likely to increase the variability of income. These points are discussed below.

Shank (1976) and Radebaugh (1974), among others, point out that some reported translation gains/losses will never be realized, especially for independent autonomous subsidiaries with significant local financing. Hence, the exchange adjustment reported in conformity with FASB No. 8 may not reflect the economic exposure of the firm. Even though the FASB clearly said in the discussion to FASB No. 8 (para. 96-111) that they are not trying to assess the economic effect of rate changes, critics feel that the reported gain/losses may be construed by the market as economic, rather than accounting effects. In a letter to the FASB, for example, Rexford Bruno, Senior Vice President of UAL, Inc., said:

We believe there is an inequitable, misleading, unrealistic and unintended situation arising from application of FASB No. 8. ...we believe that the application of Statement No. 8 in Western's situation does not reflect economic reality when, in fact, there is limited economic exposure to Western. (May 31, 1978)

Hoyt (1972) and Prindl (1976) are among those who claim that the actual economic effects of a rate change are difficult to determine. Foreign currency translation is a complicated area and even expert analysts may disagree as to what constitutes an economic change to a firm. The reason is that economic effects are conditioned on all facets of a company's operations including decisions such as the extent to which the selling price of goods can be increased. The actual tax effects of a currency change are difficult to determine due to the differences in tax laws in various countries. Also, information about economic effects may not be available to the market from other published sources.

With the advent of floating exchange rates, large random changes in the translation adjustment may occur and their inclusion in income may cause an increase in variability of earnings, especially for quarterly earnings. Some managers and authors felt that this variability in reported earnings will hurt firms in the stock market. "Executives have been grumbling that this new procedure increases the volatility of their companies' reported profits, confuses investors and, consequently, puts a damper on stock prices" (Snyder, 1977, p. 85). To sum up, the implication is that a company's reported profits are likely to be distorted by the implementation of FASB No. 8, and that distortion is likely to hinder the ability of investors to correctly assess the distributions of future values of firms' securities. A consideration of modern finance theory leads to a different view, however.

The semi-strong form of the efficient market hypothesis states that all relevant, publicly available information is quickly and unbiasedly incorporated in the market prices of securities. Fama (1970) reviews many studies which conclude that capital markets are informationally efficient. Kaplan (1978) and Gonedes and Dopuch (1974) extensively review research that measures the effect of changes in accounting techniques on stock prices. The evidence shows that accounting changes are not associated with changes in stock prices, unless the accounting change has real cash flow implications. The accounting changes required by FASB No. 8 do not in themselves have any such consequences; so, the stock prices of multinationals should not be affected--at least not due to any distortion or increase in the volatility of reported earnings. Kaplan also reports on studies that have found that as long as adequate

disclosure is made, it does not matter if the disclosure is made in footnotes, in the income statement or the balance sheet. Consequently, the disclosure of the translation adjustment as part of income instead of being part of a reserve account should not be expected to have any effect on the stock price behavior of MNC. Had FASB No. 8 required the disclosure of previously publicly unavailable information, it would have been expected to have an effect on the security price behavior of firms. Whereas FASB No. 1 may have required the disclosure of important new information useful for valuing the securities of MNC, it is assumed in this research that FASB No. 8 did not call for providing any significant information, beyond what had been required by FASB No. 1, that would be useful to market agents in analyzing security prices.

One possible effect of the disclosure of translation adjustments as part of income, required under FASB No. 8, could be the lowering of credit ratings of MNC by agencies that use the stability of earnings as a factor in ratings. Some firms may also run into difficulties with restrictive debt covenants that might require refinancing under unfavorable terms. If such is the case, an efficient capital market may react adversely to the affected firm's securities. However, sufficient data are lacking to identify and test these effects on a specific set of firms.

Management Behavior. Implementation of FASB No. 8 may indirectly impact on the security price behavior and the structure of the balance sheets of MNC, through the behavior of management. How investors actually react to different accounting methods and disclosures may be quite different from management's perception of how investors behave.

If managers believe that investors are fooled by accounting changes or by the inclusion of exchange adjustments in income, that is, the capital market is not efficient in processing information, they may take action to minimize the accounting risk due to FASB No. 8. There is some evidence that management indeed believe the capital market to be inefficient. Senior Vice President of UAL, Inc., Rexford Bruno, in a letter to the FASB (May 1978):

From another standpoint, our management thinking regarding foreign investment has changed significantly as a result of Statement No. 8. No longer do we evaluate an investment based only on its economic merit. We must now evaluate the potential for financial statement fluctuations caused by unrealized foreign currency translation gains and losses and what impact they may have on users of financial statements. It is our opinion that the inclusion of unrealized gains and losses in earnings is definitely misleading to all but perhaps the most sophisticated user.

Citibank, in its Monthly Economic Letter (May, 1978): "Companies are reported to be borrowing or lending in various currencies with the objective, at least in part, of reducing their exposure under FASB #8" (p. 8).

Managements may also be motivated to minimize the impact of FASB No. 8 on reported earnings due to its effect on managements' reward structure (bonuses, stock options, etc.). In a questionnaire used in this study (discussed later) 18 out of 100 firms reported that managers' rewards are linked to the accounting effect of FASB No. 8.³ The results of the questionnaire show that in 1975, 1976, and 1977 the number of firms that had taken action to cover accounting exposure was 11, 16, and 24 respectively.

Hedging Methods. To counter the effects of exchange rate fluctuations, firms can use a number of techniques. These techniques can be divided

into two main categories. The first category consists of various operating and financing decisions. The second category consists of the use of forward exchange contracts. The operating and financing techniques include local currency borrowing and the management of leads and lags in trade settlement. As the name implies, leads and lags refer to a firm's ability to expedite or delay payments, receipts, transfer of dividends, or transfer of other funds across countries. Firms with subsidiaries in a number of countries may also try to set transfer prices to maximize total company dollar profits. Of course, the choice of the country in which foreign direct investment is to be made, or from which goods are bought or sold is a major long range decision.

The second method available to firms is to hedge their positions by entering into forward exchange contracts to buy or sell foreign currency at previously contracted rates. The market for foreign currency is similar to the market for commodities. In the forward exchange market, companies can, for most major currencies, buy or sell foreign currency for future delivery. The general principle is as follows:

- (a) To hedge net exposed foreign liability position or pay foreign currency in future--purchase foreign currency forward contracts now, and
- (b) To hedge net exposed foreign asset position or receive foreign currency in future--sell foreign currency forward contracts now.

Net exposed foreign asset/liability position in an accounting sense is defined as net assets (assets--liabilities) translated at current exchange rates.

Firms have usually hedged foreign currency in order to protect the economic value of the firm. The amount of hedging would generally depend upon the extent of the firm's ability or desire to bear economic risk in the short term. Nowadays, for firms concerned about the reporting effects of FASB No. 8 on market agents, hedging the accounting exposure risks can neutralize the consequent gain/loss to be reported--thus actually causing a change in the firm's economic value by attempting to neutralize a reporting artifact.

This hedging of accounting risk causes an economic impact on a firm that is expected to affect the security price behavior of the firm. Whereas the security returns of firms hedging accounting risk are expected to be negatively affected in the long term (5-10 year period), the directional effects on security prices cannot be specified on a year-to-year basis. The reason is that a forward exchange contract made to cover accounting exposure may result in short run real profits or losses to the firm, depending on the realized currency movements of the contract. Firm specific data about forward exchange contracts are not publicly available.

Effects on Balance Sheet Structure. Management behavior to counteract the effects of FASB No. 8, to the extent that it took place, may also affect the balance sheet structure of the corresponding firms. This is possible if managements change their operating financing decisions in response to FASB No. 8. In a study sponsored by the FASB, Evans, Folk, and Jilling (1978) assessed the impact of FASB No. 8 on the foreign exchange risk management (FERM, hereafter) practices of MNC. They sent questionnaires to 430 MNC of which 156 completed the questionnaires.

Some of their findings are:

- (1) Firms that changed accounting method are more aggressive in FERM and are still adapting to FASB No. 8.
- (2) FASB No. 8 had an impact on firms' FERM practices.
- (3) The major adjustments in FERM methods include changing foreign currency borrowing levels, changes in subsidiary dividend payment and use of forward exchange contracts.
- (4) FASB No. 8 had an impact on firms' investment policies.

Due to lack of specific data, we cannot specify any expected directional effects of management behavior on firms' balance sheet structure.

Review of Previous Empirical Studies on FASB No. 8

Rodriguez (1977) examined the impact of FASB No. 8 on reported earnings of firms in 1974 and 1975. Basically, she surveyed the annual reports of 70 multinational corporations. Rodriguez found that in only 23 firms did FASB No. 8 have a "material" impact on reported earnings measured as the difference in reported earnings under FASB No. 8 and the earnings based on the previously used translation method. Ten of the 23 firms had an impact on earnings by less than 5%. The author concluded that the adoption of FASB No. 8 did not appear to have significantly changed the earnings reported by most MNC. In a review article, Griffin (1979) pointed out that Rodriguez's study is based on earnings of companies that had adopted FASB No. 8 voluntarily prior to the effective date. It is therefore possible that the firms surveyed are likely to be the least affected by the switch to FASB No. 8.

In a study sponsored by the FASB, Dukes (1978) investigated the effects of FASB No. 8 on the security return behavior of MNC. On the basis of three

test periods and five methods of analysis, Dukes concluded that the "issuance and implementation of FASB Statement No. 8 does not appear to have had significant detectable effects on the security returns of multinational firms" (p. 3). The approach and methodology used by Dukes are in many ways similar to those used here. However, many additional tests were performed here.

Dukes selected 479 New York Stock Exchange firms that had security return data available from January 1965 through December 1976, as his information sample. He classified the firms into six groups according to the monetary/nonmonetary, current/noncurrent, and hybrid accounting methods and by whether the exchange adjustment was included in income or deferred by firms. He obtained the accounting method used by firms from Disclosure Journal (1975), which has data from the 1974 annual reports. One possible error in this classification method, recognized by Dukes, is that firms in years prior to 1974 could have been using different translation methods. Dukes did not change the composition of portfolios in 1975 or 1976, but about half the firms switched to the monetary/nonmonetary method in 1976. So, his portfolios do not consist of firms using the same accounting method throughout in 1975 and 1976.

The three test periods studied by Dukes were (1) January 1968-December 1969 (2) January 1970-December 1974 (3) January 1975-December 1976. As FASB No. 1 became effective on December 1973 and presumably provided new disclosures starting in 1973, the years 1968-1972 may not be appropriate control periods.

For tests on portfolios, Dukes first compared the means of returns of MNC firms with those of domestic firms and found no significant difference

in each of the three test periods. Second, he used the market portfolio as a control and found no significant difference between MNC and the market portfolio in period 3. However, he did find a significant difference in periods 1 and 2. Also, when he compared MNC previously following FASB No. 8 (his portfolio No. 3) with other MNC he found a significant difference in test period 1. As he found that return distributions of test firms were different from those of control firms in the pre-FASB No. 8 period, for two testing methods, conclusions about the test results of the post-FASB No. 8 period may be less than accurate.

At the individual security level, Dukes conducted two tests. First, he used the Chow test to see if the regression model's parameters had changed for the market model. He used the years 1972-1975 as the pre-FASB No. 8 period and 1976 as the post-FASB No. 8 period, and found no statistical difference in the model structure. As about half the firms switched to FASB No. 8 in 1975 and as Dukes himself included 1975 in the post-FASB No. 8 period in his first three methods of analysis, the Chow test results must be interpreted with caution. Second, Dukes compared the variability of the return residuals of MNC for 1975 & 1976. Again, he found no increase in the variability of the return residuals. The criticism made in the case of the Chow test holds here also. As about one half of the MNC switched to FASB No. 8 in 1975 and the other one half in 1976, any increase in variability of return residuals due to FASB No. 8 would not be detectable by Duke's procedure. So, his conclusion that "both individual security level tests suggest that the number of firms whose security returns were measurably affected by Statement No. 8 is small, if indeed they can be identified at all" may be premature.

Finally, Dukes compared the returns of the MNC having a high magnitude of foreign operations with those of MNC having a low magnitude of foreign operations. He used (a) foreign sales as a percentage of total sales (b) foreign assets as a percentage of total assets and (c) exchange adjustment as a percentage of operating income as alternative measures of magnitude of foreign operations. His test period was January 1975 to December 1977 in each case. The information on the magnitude of foreign operations was obtained from 1976 annual reports, and due to inadequate sample size he left out firms using the monetary/nonmonetary method (his groups 3 and 4) from the statistical tests. He found that foreign assets was the only measure of magnitude that produced significant results at the 10% level. While foreign sales and foreign assets are appropriate measures of the magnitude of foreign operations, the exchange adjustment does not measure the magnitude of foreign operations because the exchange adjustment reported by a firm is a function of the translation method used, the balance sheet structure of the company, hedging behavior of the company and movement in foreign exchange rates. It is interesting to note that in his analyses of the magnitude of foreign operations, both for exchange adjustments (his Table 13, page 58) and for foreign revenues (his Exhibit C5, page 95), Dukes found unusual security behavior in 1977. The cumulative return differences increased dramatically in 1977. No good explanation for this difference has thus far been provided.

Fredrikson and Mogus (1978) examined the security return behavior of MNC to determine if the returns of firms that were required to change their translation methods were statistically different from the returns of firms that were already using a translation method that approximated the FASB No. 8 method. They selected 400 firms that were listed on the PDE compustat tape

and whose translation method prior to FASB No. 8 was known; it is not clear exactly which year's annual reports were used to determine the translation methods. The 400 firms were classified into four groups by translation method (monetary/nonmonetary and current/noncurrent) and treatment of the exchange adjustment (recognize currently and deferral). The firms using the monetary/nonmonetary method with current recognition of the exchange adjustments were treated as the control group, against which the other three groups were compared.

The test period was the 24 month period November 1975 through October 1976. The authors compared the average residual returns of the three test groups against the control group. Using the F test and Dunett's t, the authors found no significant difference between the security returns of the test and control groups.

The authors also partitioned and compared firms by size of foreign revenue (more than 30% vs less than 20%), firm size (more than \$1000 M vs less than \$300 M), number of countries (more than 12 vs less than 5) and industry (4 groups). In each case, they found no significant effect of FASB No. 8 on security prices.

Makin (1978) examined the impact of FASB No. 8 on security returns of MNC. Makin used three groups of firms, classified into domestic, MNC, and MNC "sensitive" to FASB No. 8, and five test periods. Using the effect on market model parameters to infer the impact of FASB No. 8, he found that the cost of capital of the "sensitive" group was slightly adversely affected. A commentator has noted that there are some methodological weaknesses in this study. Some firms included in the "sensitive"

group were using the monetary/nonmonetary method with immediate recognition of exchange adjustment prior to FASB No. 8, and consequently should have been unaffected by FASB No. 8.

Notes

1. See, for instance, Giddy (1977), Prindl (1976) and Shank (1976) for various measurements of economic exposure.
2. Some papers dealing with the choice of the translation method are: Fredrikson (1973), Gillick (1974), Hayes (1972), Lorensen (1972), Pakkala (1975), Parkinson (1972), Radebaugh (1974), Seidler (1972), and Shwyader (1972).
3. The results of the questionnaire are given in Appendix B.

CHAPTER III RESEARCH DESIGN

In the previous chapter, the possible effects of FASB No. 8 on security return behavior and on the balance sheet structure of MNC were discussed. The broad hypothesis about expected FASB No. 8 effects on security price distributions and balance sheet structure are developed next. Then, the theory and measurement methods of any effects on security returns are presented in this chapter.

Hypotheses

The possible hypotheses that follow from the discussion in Chapter II, formulated in the null form, are:

- (1) FASB No. 8 had no impact on the security return distributions of MNC as market agents are not misled by the inclusion of unrealized translation adjustments in earnings and the resultant increased volatility of earnings. (The market is informationallly efficient)
- (2) Capital markets are efficient and FASB No. 8 had no impact on the security return distributions of MNC because there was no release to the capital market of new information useful in assessing the return distributions of MNC.
- (3) Capital markets are efficient and FASB No. 8 had no impact on the security return distributions of MNC only because there were no actions to neutralize the effects of FASB No. 8 on reported earnings (accounting risk).

- (4) Capital markets are efficient and FASB No. 8 had no impact on the security return distributions of MNC because there were no effects of FASB No. 8 on firms' financing activities through restrictive debt covenants and adverse credit ratings.
- (5) FASB No. 8 had no impact on the structure of the balance sheet of MNC, because there were no management actions to neutralize accounting risk.

For reasons discussed in the previous chapter, the null forms of hypotheses (1) and (2) are assumed to be correct in this research. However, it should be noted that in the testing of hypotheses (3), (4) and (5), the tests are really joint evaluations of those hypotheses and hypotheses (1) and (2).

Based on the discussion in Chapter II, it is reasonable to expect the rejection of hypotheses (3) and (4). If hypothesis (3) is rejected, the alternative hypothesis is that FASB No. 8 had an impact on the security return distributions of MNC because management took actions to neutralize accounting risk. This impact on the security returns of MNC may be positive or negative as there is no a priori basis to expect a directional impact.

If hypothesis (4) is rejected, the alternative hypothesis is that FASB No. 8 had a negative impact on the security return distributions of MNC. However, in this research, no attempt is made to test hypothesis (4). Therefore, if a negative impact on the security returns of MNC is observed in empirical testing, it will be impossible to differentiate between hypothesis (3) and hypothesis (4). But as hypothesis (4) is expected to affect relatively few firms, any observed impact may be assumed to be due to the rejection of hypothesis (3).

Some a priori support also exists for the rejection of hypothesis (5). Again, no expected directional impact can be specified for the alternative hypothesis.

Measuring Effects on Security Returns

In measuring the effects of accounting changes on security price behavior, the assumption made is that the assessment of the probability distribution of returns is the object of interest to market agents. The semi-strong form of the informational efficiency of the capital market is a maintained hypothesis. This hypothesis states that all publicly available information (relevant to valuing firms) is rapidly and unbiasedly incorporated in security prices.

Given a capital market in equilibrium, a new disclosure is defined to have information content if the distribution of returns of the corresponding security is affected. One version of the Sharp-Lintner two-parameter capital asset pricing model relates expected returns and relative risks in equilibrium as

$$E(\tilde{R}_{it}) = R_{ft} + (E(\tilde{R}_{mt}) - R_{ft}) \beta_{it}$$

where $\tilde{R}_{it}$ = Rate of return on security i for the period t

$\tilde{R}_{mt}$ = Rate of return on the market portfolio

$\tilde{R}_{ft}$ = Risk-free rate of return

β_{it} = $\text{Cov}(R_{it}, R_{mt}) / \text{Var}(R_{mt})$ = relative risk

E = the expectation operator, and tildes denote random variables.

This model states that the equilibrium expected return on an asset is a linear function of its relative risk, β_i and that two assets with the same β_i must have the same expected return. This property is exploited in both cross-sectional tests and time-series tests to determine the information content of FASB No. 8.

Cross-sectional Tests on Security Returns. The approach used here was introduced by Gonedes (1975). His design, based on multivariate comparisons of vectors of mean returns, has been used by Harrison (1977), Ro (1978) and Ajinkya (1978) among others. According to this approach the actual returns of a number of relative risk equalized portfolios are simultaneously compared cross-sectionally. The main points of the method are as follows:

Let θ_{it} be a variable conveying new information pertinent to valuing firm i at time t . Then the information content of θ_t can be determined by comparing the distribution function of returns, R_t conditional on two realizations (θ_t^1, θ_t^2) of θ_t . Let G stand for the multivariate distribution function of returns R_t . If the assets have equal systematic risk, β^* , obtaining $G(R_t|\theta_t^1) \neq G(R_t|\theta_t^2) \neq G(R_t)$ implies θ_t has information content. Assuming the distributions to be multivariate normal, the comparison reduces to testing for differences in the mean vectors and the variance-covariance matrices of the two distributions. The appropriate test for differences of mean vectors is the Hotelling's T^2 test, and the test for differences in covariance matrices is Box's χ^2 test. The construction of the time series of relative risk equalized returns is explained in a later section.

In this study, three different variables are independently considered to see if there is any interaction between them and the accounting method for translation. The first variable is 'change in exchange adjustment' (CEA), defined as:

$$CEA = (\text{Exchange Adjustment})_t - (\text{Exchange Adjustment})_{t-1} \text{ where } t=\text{year.}$$

It is assumed that the knowledge of the exchange adjustment is somehow

useful to investors in setting security prices and it is assumed that investors try to predict the amount of gain (loss) due to the exchange adjustment component. It is possible that our assumption about forecasts of CEA by investors is unwarranted, in which case this variable will not have any effect in the tests. We further assume that the exchange adjustments follow a random walk and that investors use a naive prediction model, i.e.

$$E(\text{Exchange adjustment})_t = (\text{Exchange adjustment})_{t-1}$$

where E = Expectation operator

t = Year.

Therefore CEA is a measure of the forecast error for exchange adjustments, which may have information content. In this study, only the sign of the CEA is used for simplicity. So, CEA has only two levels, "increase" and "decrease," depending on whether the reported exchange adjustment increases or decreases in period t , for a particular firm.

The second variable considered is the sign of the exchange adjustment (SEA) reported in any period t , and this has two levels (positive or negative). In previous research, the errors in earnings forecasts have been shown to have information content (Ball & Brown, 1968). After the implementation of FASB No. 8, the earnings of MNC include the exchange adjustment. As the magnitude and sign of the exchange adjustment are difficult to forecast, and usually unknown to market agents before financial reports are released, the disclosure of the exchange adjustment (which is a component of net income) may be assumed to modify the earnings forecast. So, if investors take the exchange adjustment into account in setting security prices, there may be differential reaction to firms

having positive and negative exchange adjustments as investors will be able to use this information to modify their forecast of earnings without the exchange adjustment.

Interaction between translation methods and the size of foreign revenues (FR) of a firm is also hypothesized, based on previous research by Robbins & Staubaugh (1972) finding a definite relation between the magnitude of foreign operations and management's attitude toward risk and choice of hedging methods. So, different magnitudes of FR are used as a surrogate for different management attitudes toward accounting risk, and an effort is made to isolate management's reaction through subgrouping by size of FR. Robbins and Staubaugh classified firms with foreign revenues greater than \$500 million as large, firms with foreign sales between \$100 million and \$500 million as medium, and firms with foreign revenues less than \$100 million as small. In this study, firms with foreign sales greater than \$200 million are classified as large, while other firms are considered small. The latter classification scheme was chosen to obtain approximately equal numbers of firms in the large and small categories.

Time Series Tests on Security Returns. In previous studies using the Gonedes methodology, the test groups are assumed to be invariant over time. In this study, we would like to test the information content of various groups of firms before and after the change in accounting method. The cross-sectional tests discussed above cannot be used unless some modification is made to remove the effect of changing market conditions, measured by R_{mt} . An alternative approach, introduced by

Ajinkya (1978), is used instead. The method is essentially a multivariate analog of the univariate cumulative average residuals (CAR) procedures used widely (Fama, Fisher, Jensen & Roll (1969); Abdel-Khalik & McKeown (1978).

One commonly used form of the asset pricing model, based on ex post data, is called the "market model":

$$R_{it} = \alpha_i + \beta_i R_{mt} + u_{it}$$

where β_i = estimated relative risk parameter

α_i = estimated intercept

R_{it} = the observed return on security i in period t

R_{mt} = the observed return on a market index in period t

u_{it} = the unexpected component of total return R_{it}

For a portfolio of N securities, the average residual return is given by:

$$U_t = \frac{1}{N} \sum_{i=1}^N u_{it}, \text{ where } t = 1, 2, \dots, T, \text{ the test period.}$$

Subject to the assumptions of the market model, this U_t metric is free of market influences and can be used for comparison of test (MNC) firms before and after the accounting change.² As in the cross-sectional tests, the distribution functions of the average residuals are compared simultaneously, for the various groups of interest. The method of obtaining the average residuals is explained in a later section.

Problems in Measuring Effects of FASB No. 8

In the procedures described above to measure the effects of FASB No. 8 on security return behavior, it is implicitly assumed that no other information relevant to valuing firms is being simultaneously released to the market, or that the additional information is being randomized

among the firms in a particular test portfolio. These are two factors that may cause problems. The first is the economic effect of currency fluctuations on MNC and the second is the effect of the annual earnings announcements.

Effect of Currency Fluctuations. A devaluation (revaluation) of a foreign currency has important implications for the profitability of a firm with a subsidiary in that country. Under the regime of floating exchange rates that started in 1971, these changes in exchange rates have become continuous, even though the magnitude of the change in any period may have become much smaller than the sharp changes that sometimes occurred in the days of the fixed parity system.

The economic effect of changes in exchange rates on a particular firm depends on a number of factors, including changes in prices of inputs and outputs, taxes, interest rates, financial structure of the firm and government controls on foreign currency transfers. In evaluating the effects of FASB No. 8, it would be ideal if the real effects of floating exchange rates on a firm in each period could be isolated. The problem is both the lack of an operational model that adequately links changes in exchange rates to the values of firms, and detailed firm-specific data.

Consequently, the assumption made in our analysis (and implicitly in other studies on the impact of FASB No. 8) is that changes in exchange rates are randomized for the portfolio of MNC. This assumption may not be unreasonable, given that each firm usually deals in many currencies and that each portfolio consists of many firms.

Effect of Annual Earnings Announcements. Many studies have documented the information content of the annual earnings numbers. Kaplan (1978) reviews the findings of the major studies, and concludes that the studies provide fairly convincing evidence that the earnings numbers have information content. Gonedes (1978), in testing the joint effects of annual dividend and extraordinary items with annual income signals concluded that the dividend and extraordinary items had no information content beyond what is included in the earnings numbers. The implication for this study is that the effect of earnings announcements may bias the results about the effects of FASB No. 8. In this research, it is assumed that the effect of earnings announcements will be randomized for each portfolio of test and control firms.

Data

The initial objective was to identify a sample of MNC that would be affected by FASB No. 8. At this stage, one restriction on the sample was that data for the firm were continuously available on the CRSP tape from January, 1969, through December, 1977. Second, for convenience only New York Stock Exchange (NYSE) firms were selected. Disclosure Journal (1974) was used to identify firms under the categories of "current/noncurrent method," "monetary currency translation method," etc. This list was further augmented by a list of firms that were included in Accounting Trends and Techniques and had foreign currency translation disclosures. Firms included in a Peat, Marwick, Mitchell & Co. survey (1977) and those listed in a survey by Vaupel and Curhan (1968) were also included. This selection process resulted in 427 firms. A questionnaire, described below, was mailed to these 427 firms. A copy of the questionnaire

and cover letter is included in Appendix A. The principal data requested in the questionnaire for each of the years 1970-1977 were:

- (1) the exchange adjustment for each year, disaggregated by gains (losses) due to translation, transaction and forward exchange contracts.
- (2) the accounting method used for translation of foreign currency statements.
- (3) the magnitude of the foreign revenues of the firm.
- (4) whether the firm hedges against the accounting risk associated with currency translations, and the methods used for such hedging.

One hundred firms responded to the questionnaire, with most firms providing all the data requested. Summary responses to some of the questions not directly used in this research are given in appendix B. Only one mailing was sent, without any follow-up letters. As in all questionnaires, there may be some response-rate and self-selection bias. While the response rate was not poor (24%) for a survey of this type, a sample size of 100 firms was considered inadequate for this study. To further increase the sample size, annual reports kept at the University of Florida library were used to manually collect data on firms on which adequate questionnaire responses were unavailable. The data collected for each of the years 1973-1977 from the annual reports were:

- (1) the accounting method used for translation;
- (2) the magnitude of the exchange adjustments;
- (3) the magnitude of the foreign revenues;
- (4) whether the firm took action to neutralize accounting risk.

As most firms did not provide an unambiguous breakdown of realized (transaction) and unrealized (translation) exchange adjustments, only total exchange adjustments were used in the analysis. A total of 340 firms (inclusive of the 100 firms that responded to the questionnaire) with some or all of the required data, were selected at this stage. A listing of these 340 firms is provided in appendix C.

For some firms, annual reports for particular years were unavailable. Also, sometimes, the magnitude of the exchange adjustment was mentioned to be "immaterial" or not mentioned at all. In both circumstances, the exchange adjustment was coded as zero. That is, a zero exchange adjustment could imply a missing report, or an "immaterial" exchange adjustment. Of the 340 firms for which data were available the exchange adjustment was recorded as zero for 55 firms, in each of the five years of interest (1973-1977). Due to the filter used (discussed later) on the magnitude of exchange adjustments, these 55 firms were excluded from all of the statistical analysis except for descriptive statistics on the data. An additional 4 firms had a January or February fiscal year end and were removed (for reasons explained in the section on time periods on tests), leaving a final sample of 281 test (MNC) firms.

Forty-four of the 281 multinational firms selected (15.5%) did not disclose their foreign revenues in any of the five years. For these firms, the foreign revenues were estimated by this researcher on a case-by-case basis. If the foreign revenue was available for at least one year, that revenue number was used for the remaining years. So, while the data on foreign revenues are softer than the data on exchange adjustment and accounting method, their importance is limited because foreign

revenues are used only to classify firms into "large" and "small" foreign revenue groups.

A few firms mentioned in the questionnaire or in the annual reports that they took particular hedging actions to neutralize the accounting exchange adjustments. These data were used to identify firms that were taking "action" against accounting exposure.

Control (Domestic) Firms. The pool of control firms consisted of all the firms on the CRSP tape that met the data requirement, and were not included in the pool of test firms. From this control pool, 281 firms were selected to match the industry classifications of the test firms. An attempt was made to pairwise match the selected domestic firms to the 281 test firms on the basis of the two-digit SEC industry code. Due to the limited number of firms in the control pool, the matching has not been satisfactory. A note of caution about the control firms is appropriate. By the selection process, it was attempted to limit control firms only to domestic firms. However, no specific checks were made to ensure that the firms included in the domestic group did not have significant foreign direct investment, as these checks would not be practical. Additionally, the selection process resulted in selecting control firms that were smaller in size than the test firms.

Descriptive Statistics. Some descriptive statistics of the test and control firms are shown in Tables 5 through 9. Table 5 provides the frequency distribution of the accounting method used by the test firms for the years 1973-1977. The change to the monetary/nonmonetary method seems to be equally divided between 1975 (108 firms) and 1976 (104 firms).³

The frequency distribution of the magnitude of foreign revenues is reported in Table 6. These numbers should be viewed with the fact in mind that the foreign revenues for 15.5% of the firms were extrapolated by the researcher. In Table 7, the frequency distribution of exchange adjustments as a percentage of net income is provided for the years 1973-1977. Note that the numbers given are percentages of net income before extraordinary items, as reported on the COMPUSTAT tape. Insofar as the exchange adjustment is already included in the income number, the percentage exchange adjustment reported is biased upward for losses and biased downward for gains. For cases where the net income is negative, the biases are reversed. The number of firms reporting large exchange adjustments increased every year, with a substantial jump in the 1974 fiscal year. For example, the number of firms with exchange adjustments of 3% or greater are 95, 115, 115, 136, and 111 for the years 1973-1977 respectively. Some possible explanations are: (1) the exchange rates could have become more volatile in that period, under the floating exchange rate system; (2) increased disclosure of exchange adjustments by firms; and (3) changes in accounting method by firms may affect the magnitude of the exchange adjustment reported in 1975 and 1976.

The industry numbers of the test and control firms are reported in Table 8A. The matching is obviously poor, but both groups are well diversified over industries. The test firms do have a high concentration in classification 28 (Chemicals & Allied Products) and in classification 35 (Engines, Machinery, Turbines) which may introduce some bias. Also, control firms include some utilities (classification No. 48 and 49) not present in test firms.

The distribution of the month of the fiscal year end is shown in Table 8B. Seventy-four percent of the test firms and 69 percent of the control firms have December end fiscal years. As mentioned earlier, firms with fiscal periods ending January and February were removed from the test group.⁵

In Table 9, comparative statistics about the income and revenue of the test and control firms are provided for each of the years 1973-1977. On the average, the test firms are four times as large as the domestic firms.

TABLE 5Frequency Distribution by Accounting Method: Test (MNC) Firms

Accounting Method	Frequency				
	1973	1974	1975	1976	1977
C	140	135	64	15	7
H	118	124	81	25	13
M	67	70	178	282	304
Other	8	8	6	1	0
not available	7	3	11	17	16
total	340	340	340	340	340

TABLE 6Frequency Distribution by Size of Foreign Revenue: Test (MNC) Firms

Size (million \$)	Frequency				
	1973	1974	1975	1976	1977
500 and above	66	78	81	85	81
400-499	18	13	17	17	23
300-399	18	26	27	21	20
200-299	45	39	39	42	42
100-199	83	80	78	76	78
less than 100	110	104	98	99	96
total	340	340	340	340	340

TABLE 7

A. Frequency Distribution of Exchange Adjustment as a
Percentage of Net Income: Test Firms

Exchange Adjustment (%)	1973		1974		1975		1976		1977	
	<u>F^a</u>	<u>CF^b</u>	<u>F</u>	<u>CF</u>	<u>F</u>	<u>CF</u>	<u>F</u>	<u>CF</u>	<u>F</u>	<u>CF</u>
-21 and less	2	2	8	8	11	11	11	11	9	9
-11 to -20.9	8	10	17	25	14	25	19	30	18	27
-7 to -10.9	4	14	19	44	12	37	29	59	20	47
-3 to -6.9	18	32	36	80	38	75	43	102	43	90
-1 to -2.9	17	49	35	115	39	114	30	132	39	129
-.9 to +.9	183	232	159	274	142	256	145	277	176	305
1 to 2.9	45	277	31	305	23	279	24	301	14	319
3 to 6.9	36	313	20	325	31	310	16	317	10	329
7 to 10.9	14	327	2	327	14	324	5	322	5	334
11 to 20.9	7	334	7	334	7	331	9	331	3	337
21 and above	6	340	6	340	9	340	9	340	3	340

^aF = Frequency^bCF = Cumulative Frequency

TABLE 8

A. Firms by Industry Number

<u>Test Firms</u>			<u>Control Firms</u>		
<u>IN</u> ^a	<u>F</u> ^b	<u>CF</u> ^c	<u>IN</u>	<u>F</u>	<u>CF</u>
10	2	2	10	12	12
13	7	9	12	1	13
14	3	12	13	10	23
16	1	13	14	1	24
20	24	37	15	2	26
21	1	38	20	21	47
22	3	41	21	6	53
23	3	44	22	14	67
24	2	46	23	8	75
25	3	49	24	1	76
26	12	61	25	2	78
27	1	62	26	10	88
28	50	112	27	8	96
29	7	119	28	12	108
30	5	124	29	6	114
32	12	136	30	6	120
33	12	148	31	8	128
34	13	161	32	20	148
35	42	203	33	19	167
36	17	220	34	10	177
37	20	240	35	17	194
38	13	253	36	11	205
39	5	258	37	17	222
50	2	260	38	12	234
51	2	262	39	5	239
54	1	263	40	5	244
65	1	264	45	3	247
67	11	275	47	1	248
70	1	276	48	2	250
73	1	277	49	13	263
75	1	278	50	2	265
89	3	281	51	1	266
			65	1	267
			67	8	275
			70	1	276
			72	1	277
			73	1	278
			75	1	279
			79	1	280
			89	1	281

^aIN = 2-Digit Industry Number^bF = Frequency^cCF = Cumulative Frequency

TABLE 8 (continued)

B. Firms by Fiscal Year Ending: Test and
Matched Domestic Firms

<u>Fiscal Year</u>	<u>Test</u>	<u>Control</u>
1	--	6
2	1	4
3	5	11
4	1	5
5	1	5
6	20	13
7	6	6
8	5	10
9	12	17
10	16	4
11	6	6
12	208	194
TOTAL	281	281

TABLE 9

A. Statistics on Net Income of Firms
(all figures in millions of dollars)

Year	T E S T				C O N T R O L			
	Mean	S.D. ^a	Min. ^b	Max. ^c	Mean	S.D.	Min.	Max.
1973	92	228	-1	2443	22	74	-119	1071
1974	99	238	-157	3142	29	108	-38	1627
1975	90	195	-207	2503	25	80	-86	1152
1976	113	257	-78	2903	32	93	-10	1326
1977	123	282	-81	3339	32	111	-448	1535

B. Statistics on Revenue of Firms
(all figures in millions of dollars)

Year	T E S T				C O N T R O L			
	Mean	S.D.	Min.	Max.	Mean	S.D.	Min.	Max.
1973	1585	3171	29	35798	427	969	9	11176
1974	1990	3995	35	42062	550	1482	10	19795
1975	2086	4226	32	44365	560	1376	10	17516
1976	2334	4946	40	48631	625	1565	13	20388
1977	2558	5684	47	54961	687	1918	12	26052

^aS.D. = Standard Deviation

^bMin. = Minimum Value

^cMax. = Maximum Value

Note: No. of firms in Test
Sample = 340

No. of firms in Control
Sample = 281

Grouping of Firms

Firms are classified in various ways to test for information content of the accounting change. A particular grouping is chosen to enhance the possibilities of rejecting the null hypothesis of no information content, if in fact that hypothesis is false.⁶ Six different grouping schemes were employed in the testing procedure, and firms were primarily classified by the accounting method used for translation. All firms were screened by a filter on the materiality of the exchange adjustment to increase the power of the independent variable. In each period, firms were retained in the test group only if the magnitude of the exchange adjustment was equal to or greater than some designated percentage of net income. The successive percentage filter rules were 1%, 3% and 4%, which were arbitrarily chosen as a balance between obtaining an adequate sample size while excluding firms with insignificant exchange adjustments.

The first grouping scheme is based on the three accounting methods for translation used by test firms. These methods are:

- (a) current/noncurrent method (C)
- (b) all accounts at current rate except fixed assets. This method is essentially the same as the monetary/nonmonetary method with inventory at current rates and is called the hybrid method (H)
- (c) monetary/nonmonetary method (M)

For each of the years 1973-1977, the 281 test firms that passed the above-noted filter (and the corresponding control firms) were put in one of the portfolios Pc, Ph or Pm, if the accounting method used was C, H or M respectively. Note that a specific firm would be in different portfolios in different years if the firm changed its accounting method for translation.

In the second grouping scheme, six portfolios were formed on the basis of a cross-tabulation of the three accounting methods and the two levels (increase/decrease) of change in exchange adjustment (CEA) each year.

The third and fourth grouping schemes were similar to the second. In the third scheme, the variables are accounting method and magnitude of foreign revenues (large/small). In scheme four, the variables are accounting method and sign of exchange adjustment (SEA) which has two levels (positive/negative).

In scheme five, three portfolios were formed. The first portfolio consisted of firms that used the M accounting method in 1973-1974 and essentially continued doing so after FASB No. 8. The second and third portfolio consisted of firms that were using the H and C accounting methods respectively in 1973-1974 and had to switch to M after FASB No. 8. The criteria for including firms in this scheme were:

- (a) Each firm must have used the same translation method in both 1973 and 1974 (i.e., M or H or C).
- (b) Each firm must have used method M in 1976 (i.e. all firms included switched to method M in 1975 or 1976).

(c) As the aim was to keep the same firms in each portfolio in all the years, the 1% filter was not applied to firms in each year. But of the sample of 281 firms, 79 firms were excluded from all four years as they had "zero" exchange adjustments in three of the four years.

In contrast to grouping schemes 1 through 4, a particular firm stays in the same portfolio for all four years in scheme 5. Grouping scheme 5 was used solely for time series tests. In that design, the test firms served as their own control, as is explained later.

The sixth grouping scheme was based on test firms in which the management were judged (based on the best available evidence) to have hedged against the accounting risk of translation. The data were obtained from the firms responding to the questionnaire and from disclosures in annual reports, though incomplete. These firms were denoted as "Action" firms, while "No Action" firms were the remainder of the test firms. Note that the No Action pool of firms could include firms in which managements hedged against accounting risk but we are unaware of it. The Action firms selected in this manner were matched to the No Action firms by accounting method in each year. The Action firms were not screened on the basis of any filter on exchange adjustments. As before, a matched group of domestic firms was also selected.

The grouping schemes 1-6 are summarized in Table 10.

TABLE 10

Summary of Grouping Schemes

Grouping Scheme 1: Accounting Method (for Years 1973-1977)

<u>Portfolio</u>	<u>Accounting Method</u>
Pc	C
Ph	H
Pm	M

TABLE 10
(continued)

Grouping Scheme 2: Accounting Method and CEA (for Years 1974-1977)

<u>Portfolio</u>	<u>Accounting Method</u>	<u>CEA</u>
Pci	C	increase
Pcd	C	decrease
Phi	H	increase
Phd	H	decrease
Pmi	M	increase
Pmd	M	decrease

Grouping Scheme 3: Accounting Method and Magnitude of Foreign Revenues (for Years 1973-1977)

<u>Portfolio</u>	<u>Accounting Method</u>	<u>Foreign Revenues</u>
Pcl	C	large
Pcs	C	small
Phl	H	large
Phs	H	small
Pml	M	large
Pms	M	small

Grouping Scheme 4: Accounting Method and SEA (for years 1973-1977)

<u>Portfolio</u>	<u>Accounting Method</u>	<u>SEA</u>
Pc+	C	positive
Pc-	C	negative
Ph+	H	positive
Ph-	H	negative
Pm+	M	positive
Pm-	M	negative

Grouping Scheme 5: Firms Classified by Accounting Method Used in Pre-FASB No. 8 Period

<u>Portfolio</u>	<u>Accounting Method Used in 1973 & 1974</u>	<u>Accounting Method Used in 1976</u>
Pcm	C	M
Phm	H	M
Pmm	M	M

Grouping Scheme 6: Action/No Action Firms by Accounting Method

<u>Accounting Method Used in 1973 & 1974</u>	<u>Portfolio</u>	
	<u>Action Firms</u>	<u>No Action Firms</u>
C	Ac	NAC
H	Ah	NAh
M	Am	NAm

Time Periods for Tests

In studies devoted to testing the information content of accounting changes⁷ or accounting signals,⁸ the time period chosen for testing of any effects is of some importance. Usually, the date of the release of annual financial information is taken as the critical date. If the accounting data have any information content, the effect is expected to be most pronounced at the time annual reports with the changed method are first released. For operational convenience, the date of release of annual reports is taken as a surrogate for the date the financial information was first released to the market. On the average, practically all annual reports are released within three months of the fiscal year end.

In this research, for the tests described earlier, twelve month holding periods are used for tests on total returns and cumulative average residuals. In an effort to increase sample size, firms with different fiscal year ends were included, as long as their annual reports were released some time during the holding period. As most firms in the sample have December fiscal year ends, the holding period used is April through March of the following year. Firms with fiscal year ends of January and February are excluded, as their annual reports may have been released before April.⁹ An example will clarify the process. For 1973 reports, the sample includes firms with fiscal year ending March 1973 through December 1973. The corresponding holding period to test the effect of 1973 reports on security returns is April 1973 through March 1974. The assumption inherent in the above

process is that by the end of March 1973, the capital market had reached equilibrium with respect to 1972 disclosures for all firms in our sample. So, any effect of 1973 disclosures should be captured in the returns of the 12-month period, April 1973 through March 1974.

Now, the appropriate period for measuring the market effects of FASB No. 8 is considered. The various critical events and corresponding dates relevant to this research are given in Table 11A.

TABLE 11
Critical Events for FASB No. 8 and Test Periods

A. Relevant Critical Events

<u>Dec. '73</u>	<u>Dec '74</u>	<u>Oct. '75</u>	<u>Jan '76</u>	<u>March '77</u>	<u>Dec. '77</u>
FASB No. 1 adopted and effective	FASB No. 8 exposure draft	FASB No. 8 adopted	FASB No. 8 effective	first required disclosure available in annual report	final data on CRSP tape

B. Various Test Periods

<u>Test Period</u>	<u>April '73</u>	<u>April '74</u>	<u>April '75</u>	<u>April '76</u>	<u>April '77</u>	<u>Dec. '77</u>
1	←-----→					
2		←-----→				
3			←-----→			
4				←-----→		
5					←-----→	

A consideration of the critical events does not lead to an unambiguous determination of the period when effects of the switch to FASB No. 8 should be most pronounced. The date of the exposure draft, the date of adoption

of FASB No. 8, the effective date or the date when a firm actually changed to the new method are all candidates for expecting an effect of the new standard. A complicating factor is that in FASB No. 8 we have a non-discretionary accounting change, and all MNC were required to switch to the temporal method (equivalent to the monetary/nonmonetary method) by the fiscal year beginning January 1976.¹⁰ However, early adoption was encouraged, and many firms switched in 1975 and early 1976.

For the firms that adopted FASB No. 8 early, there could be some signaling effects¹¹ and investors may treat the early adopters differently from the firms that adopted FASB No. 8 only at the effective date.

In this study, comparisons will be made in various test periods, to determine in which period, if any, FASB No. 8 had an effect. The five test periods initially selected are shown in Table 11B.

Some of the considerations and expectations for the test periods are discussed next. As mentioned in Chapter II, FASB No. 1 required firms to make significant disclosures about foreign currency translations. For many firms, the market first received public information about currency translations after FASB No. 1 was adopted. The years 1973 and 1974 are considered the post-FASB No. 1 pre-FASB No. 8 period.¹² In the 1975-1977 period, presumably no new information was provided, but a nondiscretionary accounting change took place. The years 1975-1977 are considered the post-FASB No. 8 period.

Construction of Relative Risk Equalized Returns and Average Residuals.

Relative Risk Equalized Returns. From 60 to 48 months of monthly common stock return data (with dividends) from the CRSP tape were used

to estimate the relative risk of each firm by ordinary least squares regression. The value weighted market index was used. The market model was re-estimated for each of the periods 4/68-3/73, 4/69-3/74, 4/70-3/75, 4/71-3/76, 4/72-3/77, to minimize any bias due to the instability of betas. For each of these five periods, firms in each portfolio were weighted to form a portfolio of beta (relative risk) equal to one. The procedure is as follows: firms are ranked in each portfolio in descending order of $\hat{\beta}$, and divided into two groups. Let the top half of the firms have an average beta of $\hat{\beta}_1$ and the bottom half of the firms have an average beta of $\hat{\beta}_2$. The two groups are then linearly weighted to give a combined portfolio beta of one. The weights for each group, x and $(1-x)$ are calculated from the equation:

$$x\hat{\beta}_1 + (1-x)\hat{\beta}_2 = 1.$$

If both $\hat{\beta}_1$ and $\hat{\beta}_2$ have values that are larger or smaller than 1, then x is no longer in the interval $(0,1)$, implying short selling. In this procedure, groups in which the weights were larger than 1.75 were thrown out to prevent spurious weighted returns.¹³ The monthly returns of each firm in the top and bottom half of a portfolio are then weighted by x and $(1-x)$ respectively, to form the time-series of the weighted returns for each portfolio for the 12-month test period. The five corresponding test periods are 4/73-3/74, 4/74-3/75, 4/75-3/76, 4/76-3/77, 4/77-12/77. The weighted returns of the test and control firms for each portfolio are then differenced to provide the sample for the statistical tests. The above procedure was followed for the test and domestic firms in the portfolios for grouping schemes 1, 2, 3, 4 and 6.

Cumulative Average Residuals. The parameters of the market model were estimated for all test firms for each of the same five estimation periods as in the case of weighted returns above. Then, the estimated parameters were used to calculate the residuals for each of the corresponding 12-month test periods, as above. Finally, the residuals were accumulated across firms in each portfolio to provide the average residuals. The average residuals were calculated for test portfolios for grouping schemes 1 through 5.

Measuring Effects on Financial Structure

Changes in the financial structure of firms were tested by examining the structure of the balance sheet and income statement before and after the change in accounting method. The test firms were grouped according to grouping scheme 5. Annual data for the years 1973-1977 were obtained from the COMPUSTAT tape for the following accounts: (1) long-term assets; (2) inventory; (3) current liabilities; (4) long-term debt; (5) net income before extraordinary items; and (6) total revenue. To permit comparisons across firms and time periods, ratios were formed by deflating the above six accounts by total assets. We are unaware of any theory that would provide guidance on choosing the structural variables that may be affected by FASB No. 8. Intuitively, and from comments in the financial press, one can infer that managements reacting to FASB No. 8 may change the direct investment and borrowing patterns in foreign countries. Various techniques of hedging may affect the total income of a firm and the foreign revenues generated by a firm. Changes in translation methods may also affect the valuation of foreign inventories and thus the consolidated inventory account. This reasoning was the basis for choosing these six variables.

Changes in the financial structure were determined by cross-sectionally comparing the means of the average ratios of the three portfolios, Pcm, Phm, Pmm in the before-FASB No. 8 period (1973-74) and the after-FASB No. 8 period (1976-77). For each period, the four balance sheet ratios were simultaneously compared for the three portfolios. Similarly, the two income statement ratios were also simultaneously compared for the three portfolios in the before and after periods. The comparisons made are illustrated in Table 12A. The subscripts B and A refer to the before and after periods, respectively.

TABLE 12
Comparisons Made to Test Changes in Financial Structure

A. Cross-Sectional Tests (Balance Sheet and Income Statement)

<u>"Before" period (1973-1974)</u>	<u>"After" Period (1976-1977)</u>
Pcm/B vs. Phm/B	Pcm/A vs. Phm/A
Pcm/B vs. Pmm/B	Pcm/A vs. Pmm/A

B. Time Series Tests (Balance Sheet and Income Statement)

Pcm/B vs. Pcm/A
Phm/B vs. Phm/A
Pmm/B vs. Pmm/A

Note: letters c, h, m refer to the three accounting methods.

Each of the three portfolios were also compared before and after the accounting change, as shown in Table 12B.

If reports in the financial press about management reaction to FASB No. 8 are correct, and these actions lead to structural changes, then we should find a change in the structure of the Pcm and Phm firms.

Statistical Tests

Hotelling's T^2 statistic is used to test for differences in the means of two vectors. Differences in the covariance matrices of two distributions are determined by Box's χ^2 test for homogeneity of covariance matrices. The two tests are briefly described below.

Hotelling's T^2 Test

Let p be the number of portfolios.

Let $\underline{T}$ be a $(px1)$ column vector of average monthly total returns for the test firms (or average monthly residuals for test firms in the 'before' period).

Let $\underline{C}$ be a $(px1)$ column vector of average monthly total returns for the control firms (or average monthly residuals for control firms in the 'after' period).

The difference vector $\underline{D} = \underline{T} - \underline{C}$ is first formed. The T^2 statistic is given by:¹⁴

$$T^2 = N(\underline{D} - \underline{\mu_0})' S_d^{-1} (\underline{D} - \underline{\mu_0})$$

where N = number of monthly observations

$\underline{\mu_0}$ = vector of zeros

S_d = variance-covariance matrix for the differences.

If the null hypothesis holds, the quantity $F = \frac{T^2 \cdot (N-p)}{p(N-1)}$ has the F distribution with $(p, N-p)$ degrees of freedom. The decision rule is to reject the null hypothesis of no difference between vector means if F is greater than $F_{(\alpha, p, N-p)}$.

Box's χ^2 Test¹⁵

The statistic used in Box's test is

$$-2a \ln(\lambda)$$

which is approximately distributed as χ^2 with $p(p+1)(k-1)/2$ degrees of freedom, where

k = number of groups or covariance matrices being compared.

p = number of portfolios.

$$A = 1 - \left(\sum_{i=1}^k \frac{1}{N_i} - \frac{1}{N} \right) \left(\frac{2p^2 + 3p - 1}{6(p+1)(k-1)} \right)$$

N_i = number of observations in the i^{th} group

$N = \sum N_i$ = total number of observations

$$\lambda = \frac{N^{pN/2} \prod_{i=1}^k (\det S_i)^{N_i/2}}{\prod_{i=1}^k (N_i^{pN/2}) (\det S)^{N/2}}$$

$\det S_i$ = determinant of (within) i^{th} group covariance matrix (of R_{it} or U_{it}), $i=1, \dots, k$

$\det S$ = determinant of the pooled covariance matrix.

Large values of $-2\ln(\lambda)$ lead to rejecting the null hypothesis of no difference in the covariance matrices.

Interpretation of Expected Results

In this study, the tests for effects on the security return behavior of MNC--comparison of the return distributions of "test" and "control" firms--are conducted over two periods. The years 1973 and 1974, which precede the issuance of FASB No. 8, are considered the pre-FASB No. 8 period. The years 1975 through 1977 are considered the post-FASB No. 8 period.

The pre-FASB No. 8 period is utilized as a control or pre-test period in this study. During this period, FASB No. 1 was in effect, and all MNC were assumed to be making the required disclosures about the translation methods used and the amount and disposition of exchange adjustments. Hence, the security return distributions of all MNC--irrespective of the translation method used--are not expected to be significantly different from that of control firms of similar relative risk.

During the post-FASB No. 8 period, all MNC are required to follow a uniform method of accounting for foreign currency translations. Following previous research on the effects of accounting changes, reviewed by Kaplan (1978), no effect on the security return behavior of MNC due to the switch to the method recommended by FASB No. 8 should be expected. However, as discussed in Chapter II, if managements expend real resources in neutralizing the accounting exposure due to FASB No. 8, then the return distributions of MNC are expected to be significantly different from that of control firms of similar relative risk. In this discussion, the implicit assumption is that managements had no motivation to expend real resources in hedging accounting exposure before the implementation of FASB No. 8, as they were free to choose the translation method that best suited them.

In the actual test results, the security return distributions of MNC could be either significantly different or not different from the return distributions of control firms, in both the pre- and post-FASB No. 8 periods. The four possible outcomes are characterized in Table 13.

TABLE 13

Possible Outcomes of the Comparisons of the Return Distributions of Test
and Control Firms

		<u>Post-FASB No. 8 period outcome</u>	
<u>Pre-FASB No. 8 Period Outcome</u>	not different	not different	different
	different	1	2
		3	4

Note: "Different" ("not different") refers to the distributions of test firms being significantly different (not different) from control firms.

The various outcomes are interpreted as follows:

- Cell 1: The different accounting methods have no effect on the security returns of MNC in both the pre- and post-FASB No. 8 periods, implying that hypothesis 1 through 4 cannot be rejected.
- Cell 2: No effect in the pre-FASB No. 8 period provides evidence that hypothesis 1 cannot be rejected. Then, a significant difference in the post-FASB No. 8 period implies that hypothesis 3 and/or hypothesis 4 should be rejected.
- Cell 3: There is no good explanation for this result. One possibility is that an uncontrolled systematic bias exists between test and control firms. (This can occur as it was not possible to randomly assign firms to treatments.)
- Cell 4: This outcome is difficult to interpret. One explanation is that in the pre-test period there is some systematic factor affecting economic values of securities in the

sample, that is correlated with the accounting method for translation. Then, interpretation of the post-FASB No. 8 result becomes ambiguous.

Notes

1. This asset pricing model is based on several widely cited assumptions. See, for instance, Fama (1970). Black (1972) has formulated a two-factor version of the asset pricing model which is:

$$E(\tilde{R}_{it}) = E(\tilde{R}_{zt}) + (E(\tilde{R}_{mt}) - E(\tilde{R}_{zt})) \beta_{it}$$

where $\tilde{R}_{zt}$ = Rate of return on a minimum variance portfolio having $\text{Cov}(\tilde{R}_{zt}, \tilde{R}_{mt}) = 0$. Other terms are as defined previously.

2. The assumptions of the market model have been widely discussed. See for instance Fama (1976). Some of the assumptions are:
 - (1) $E(u_{it}) = 0$
 - (2) $\text{Var}(u_{it}) = \text{constant}$
 - (3) $\text{Cov}(u_{it}, u_{is}) = 0, t \neq s$
 - (4) $\text{Cov}(\tilde{R}_{mt}, u_{it}) = 0$
 - (5) $\text{Cov}(u_{it}, u_{jt}) = 0$
 - (6) α_i, β_i are constant over time.
3. In the 1977 fiscal year, all firms should have switched to the monetary/nonmonetary method under FASB No. 8. So, a check was made to see if any errors had been made. It was found that some firms had given wrong data in their questionnaire responses. A check of the annual reports of these firms revealed that four firms were continuing to use the hybrid method but claimed that inventories were small. The other firms had switched to the FASB No. 8 method in 1976.
4. The income used is data item 18 on the tape.
5. One February firm inadvertently remained in the test group, and the error was discovered after most of the tests were completed. But one firm out of 281 firms should not cause any problems.
6. See Gonedes (1975, p. 231) for a discussion of this point.
7. See Ro (1978) for an example in leases.
8. See, for example, Gonedes (1978).

9. In many papers, e.g. Gonedes (1975), Ro (1978), March fiscal year firms are also excluded. But as the reports of these firms can be released in April at the earliest, they are kept in our sample. Anyway, our sample has only a few March fiscal year firms.
10. December 1975, for 53-week fiscal year firms.
11. See Gonedes (1978) for a discussion of signalling in an accounting context.
12. The period 1970-1972 was initially considered for inclusion in the testing but was dropped due to lack of appropriate data. The major problem was that disclosures about currency translations was uneven and provided on a discretionary basis in that period.
13. Large-scale factors cause error. E.g., for weights 15, -.5 and returns 0.2, .4, weighted returns are $.5 \times 2 - .5 \times .4 = -0.1$. But equal weights of 5, -.5 give returns of $5 \times .2 - 5 \times .4 = -1.0$.
14. See Morrison (1967) for details.
15. See Box (1949), Giri (1977) for details.

CHAPTER IV TEST RESULTS AND ANALYSIS

Variability of Income

In this section, the variability of net income reported by firms over time is investigated. No attempt is made to ascribe any causal linkage to FASB No. 8. An attempt is made to simply determine the variability in income during the post-FASB No. 8 period.

Ideally, the variance of income for each firm before and after FASB No. 8 should be used to determine if adoption of FASB No. 8 is associated with an increase in the variability of income. But only a few data points before¹ and after the accounting change are available for each firm, so the variance cannot be calculated. The mean absolute percentage change in income is used as a surrogate for the variability in income each year. The values of the absolute percentage change in income for test and control firms are given in Table 14A. From the values of the coefficient of variation, it seems that the volatility of income for test firms increased in 1975, stayed volatile in 1976 and then came down to levels comparable to the volatility of income of the control firms in 1977. The average values of the absolute exchange adjustment as a percentage of net income are shown in Table 14B. The mean exchange adjustment seems to have increased in 1974 and then again in 1976, before decreasing slightly in 1977. However, the results are difficult to interpret due to the presence of some

TABLE 14

A. Mean Absolute Percentage Change in Income^{a, b}

TEST					
Year	N	% Mean	S.D. ^c	Max ^d	C.V. ^e
1977	331	39.3	72.7	900.0	1.84
1976	337	63.2	147.4	2100.0	2.33
1975	337	45.2	104.8	1266.6	2.31
1974	338	50.8	105.0	1408.3	2.06

CONTROL					
Year	N	% Mean	S.D.	Max	C.V.
1977	260	63.8	108.6	966.6	1.69
1976	260	81.0	132.8	1100.0	1.62
1975	261	62.2	92.6	650.0	1.48
1974	261	68.18	155.1	2100.0	2.27

^aPercentage Income Change is given by: $ABS((NI_i - NI_{i-1}) / (NI_{i-1}))$
 $i = 1974, 75, \dots, 77$

where i = year

^bMinimum Value = 0 in each case

^cS.D. = Standard Deviation

^dMax. = Maximum Value

^eC.V. = Coefficient of Variation = $\frac{S.D.}{Mean}$

TABLE 14 (Continued)

B. Mean Absolute Exchange Adjustment as a Percentage of Net Income
of Test Firms

Year	N ^c	Mean (%)	Standard Deviation	Min. ^a	Max. ^b (%)
1973	285	3.90	8.85	0	84.7
1974	285	5.82	16.9	0	244.0
1975	285	5.95	9.96	0	64.7
1976	285	9.61	42.3	0	555.0
1977	285	7.78	53.8	0	898.0

^aMin. = Minimum Value^bMax. = Maximum Value^cN = No. of FirmsC. Mean Absolute Exchange Adjustment as a Percentage of Net Income
With Outliers Removed

Year	N	Mean without Outliers*	No. of Outliers
1973	278	2.71	7
1974	276	3.71	9
1975	272	4.16	13
1976	269	4.42	16
1977	278	3.71	7

* Outliers defined as firms having exchange adjustment > 25%

outliers, so the mean exchange adjustment was recalculated without the outliers, and the results are shown in Table 14C. With the outliers removed, the exchange adjustment can be seen to have increased in 1974 and then again in 1975 before decreasing slightly in 1977. As FASB No. 8 was first required in 1976, the increases in exchange adjustments are probably due to currency fluctuations and not due to FASB No. 8.

Effect on Security Price Returns

The results of the various cross-sectional and time series tests on security returns are presented in this section. When a number of tests are conducted to evaluate a particular research problem, the results of all the tests should be considered together to draw a conclusion. This analysis of all the test results, by each test period, is done after all the individual results are presented.

Validation of Control. Before the test and control firms are compared under various treatment conditions one should be confident that the control is a valid one. The validity of the control was assessed by comparing the mean returns of the total group of control firms with the mean turns of the total group of test firms, after adjusting for relative risk differences. If the control is appropriate there should be no differences in the two mean returns.

The results of the comparisons of the relative risk equalized returns of all 281 test and control firms for each of the five test periods is shown in Table 15. In each of the test periods, MNC had lower returns than the domestic firms. As expected, there was no significant

TABLE 15

Total Test Firms Vs Total Control FirmsA. Results of Comparison of Risk Equalized Returns^a

Test Period	N ^d	(Test-Control) Means of Return Differences X100	Std. Deviation of Return Differences X10	t value
1 (1973 & 1974)	24	-.1639	0.281	-0.28
2 (1974)	12	-.3322	0.355	-0.32
3 (1975)	12	-.1301	0.168	-0.26
4 (1976)	12	-.749	0.147	-1.76 ^c
5 (1976 & 1977)	21	-.8511	0.133	-2.92 ^b

^aNumber of firms in each portfolio = 281^bp = 1% (20 DF)^cp = 10% (11 DF)^dN = No. of monthsB. Average of Unweighted Betas of Test and Control Group

AVERAGE BETA		
Period	Test Group	Control Group
4/68-3/73	1.147	1.136
4/69-3/74	1.247	1.26
4/70-3/75	1.17	1.18
4/71-3/76	1.16	1.15
4/72-3/77	1.16	1.09

difference between the returns of the two portfolios, using a two-tailed t test, in the first four periods. However, in the 1976-1977 period, the mean returns were significantly different at the 1% level, implying that some change took place in the period 4/77-12/77. The lower part of Table 15 shows the unweighted average betas for the two portfolios for the five periods. The average betas are similar for the two portfolios and appear to be stable over time. Of course, the betas may have changed in the latter part of 1977 for some reason. Dukes (1978) also found some unusual activity in 1977, in his tests on the effect of the magnitude of foreign operations (p. 63 and p. 96). It is unlikely that FASB No. 8 was responsible for the unexpected results in test period 5. Since only nine months of data were used for 1977, there could be some quarterly reaction that possibly averages out over the fiscal year. Further investigation of this surprising result is left for future research. However, the above finding does have important implications for interpretation of other tests on security prices in the 4/76-12/77 period. The significant differences found in the 4/76-12/77 period for other classification schemes cannot now be taken to imply effects of FASB No. 8. As such, the many test results that were significant in period 5 are probably contaminated, and so are ignored. Only the test results for test periods 1-4 are presented here.

Test Results. The detailed test results of the cross-sectional and time-series tests on security returns conducted for grouping schemes 1-6 are presented in Tables 16-23. The results of all the tests conducted on security price returns are summarized in Table 24.

TABLE 16

Grouping Scheme 1: By Accounting Method
Filter = 1%

A. Number of Firms in Each Portfolio in Each Year

Portfolio ^a	'73	'74	'75	'76	Firms
Pc	62	71	29	9	Test
Ph	44	57	45	12	
Pm	35	43	109	163	
Pc	62	70	29	8	Control
Ph	47	57	46	11	
Pm	35	43	108	161	

^aDefined in Chap. III.

Note: FILTER = ABS ($\frac{\text{Exch. Adjustment}}{\text{Net Income}}$)

TABLE 16 (continued)

B. Results of Tests on Weighted Return Differences

Test Period: 1 (1973 & 1974)		N = 24		
		Pc	Ph	Pm
Mean of Return Differences (Test-Control) X 100		-.64	-.09	-.49
Standard Deviation of Return Differences X 10		.24	.38	.44
t Values		-1.31	-.12	-.54
$T^2 = 2.4, F = .737$				
$\chi^2 (6 \text{ df}) = 11.9 (p = 6.2\%)^{**}$				
Test Period: 2 (1974)		N = 12		
		Pc	Ph	Pm
Mean of Return Differences (Test-Control) X 100		-.85	-.26	-.44
Standard Deviation of Return Differences X 10		.25	.44	.57
t Values		-.72	-.20	-.26
$T^2 = 2.4, F = .65$				
$\chi^2 (6 \text{ df}) = 3.94 (p = 68\%)$				
Test Period: 3 (1975)		N = 12		
		Pc	Ph	Pm
Mean of Return Differences (Test-Control) X 100		1.18	-.40	0
Standard Deviation of Return Differences X 10		.19	.27	.19
t Values		2.15**	-.51	0
$T^2 = 6.06, F = 1.65$				
$\chi^2 (6 \text{ df}) = 10.5 (p = 10.2\%)$				
Test Period: 4 (1976)		N = 12		
		Pc	Ph	Pm
Mean of Return Differences (Test-Control) X 100		-2.92	-.37	-.87
Standard Deviation of Return Differences X 10		.36	.40	.16
t Values		-2.74*	-.31	-1.88**
$T^2 = 8.6, F = 2.3$				
$\chi^2 (6 \text{ df}) = 11.44 (p = 7.5\%)^{**}$				

Two-Tailed Test	.05(*)	.10(**)
t(11df) =	2.2	1.79
t(23df) =	2.06	1.71
F(3,21) =	3.07	2.36
F(3,9) =	3.86	2.81

Note: Chi-square statistic applies to Box test.

TABLE 16 (continued)

C. Results of Tests on Monthly Residuals

<u>Test Period: 1973 & 1974 vs 1975 & 1976</u>		<u>N = 24</u>		
		<u>Pc</u>	<u>Ph</u>	<u>Pm</u>
Means of Residual Differences (Before-After) X 100		.24	.25	.39
Standard Deviations of Residual Differences X 10		.43	.33	.36
t Values		.27	.37	.52
$T^2 = 0.34, F = .10$				
<u>Test Period: 1974 vs 1975</u>		<u>N = 12</u>		
		<u>Pc</u>	<u>Ph</u>	<u>Pm</u>
Means of Residual Differences (Before-After) X 100		-1.15	.28	.28
Standard Deviations of Residual Differences X 10		.49	.27	.40
t Values		-.81	.35	.24
$T^2 = 13.38, F = 3.65^{**}$				
<u>Test Period: 1974 vs 1976</u>		<u>N = 12</u>		
		<u>Pc</u>	<u>Ph</u>	<u>Pm</u>
Means of Residual Differences (Before-After) X 100		.59	-.31	.82
Standard Deviations of Residual Differences X 10		.51	.32	.39
t Values		.39	-.34	.72
$T^2 = 1.663, F = 0.45$				
<u>Test Period : 1975 vs 1976</u>		<u>N = 12</u>		
		<u>Pc</u>	<u>Ph</u>	<u>Pm</u>
Means of Residual Differences (Before-After) X 100		1.75	-.60	.53
Standard Deviations of Residual Differences X 10		.36	.27	.13
t Values		1.65	-.75	1.4
$T^2 = 17.1, F = 4.66^*$				

	<u>05(*)</u>	<u>.10(**)</u>
F(3,9) = 3.86		2.81
F(3,21) = 3.07		2.36

Tests on Grouping Scheme 1: By Accounting Method. The number of firms for each portfolio for each year is shown in Table 16A. The sample size for the test and control firms is slightly different for some years due to a few return observations missing on the CRSP tape for the respective periods. Results of the cross-sectional tests on risk equalized monthly returns are provided in Table 16B. The T^2 statistic, the corresponding F value, and the χ^2 statistic is shown for the four periods over which comparisons are made. For each period, N is the number of monthly observations used. The critical values of F are also provided for the 5% and 10% confidence levels. The F value is not significant for the first four periods; however, the t test shows that the firms using the C method had mean returns larger than the control in 1975 and mean returns significantly smaller than the control in 1976. Firms using the M method also had mean returns smaller than the control in 1976, implying that individual portfolios may have been affected by the implementation of FASB No. 8. The χ^2 statistic is significant at the 10% level in periods one and four, weakly implying differences between the return covariance matrices of the test and control firms in those periods.

Results of time-series tests on average residuals are presented in Table 16C. For the test firms, mean residuals for a given test period (before FASB No. 8 period) are compared with the mean residuals for another test period of interest (after FASB No. 8 period). The T^2 statistic and F value is shown for the four comparisons. The comparisons between 1974 and 1975 are significant at the 10% confidence level, while the comparisons between 1975 and 1976 are significant at the 5% level. Interestingly, the comparison of the average residuals of 1974 versus the residuals of 1976 shows no significant differences for the three portfolios. Apparently, in 1975 there was some change in

TABLE 17

Grouping Scheme 1: By Accounting Method
Filter = 4%

A. Number of Firms in Each Portfolio in Each Year

Portfolio ^a	'73	'74	'75	'76	Firms
Pc	29	33	15	6	Test
Ph	15	28	30	8	
Pm	23	23	65	108	
Pc	29	33	15	5	Control
Ph	17	29	31	8	
Pm	24	24	65	108	

^aDefined in Chap. III.

Note: FILTER = ABS ($\frac{\text{Exch. Adjustment}}{\text{Net Income}}$)

TABLE 17 (continued)

B. Results of Tests on Weighted Return Differences

	Pc	Ph	Pm
<u>Test Period: 1 (1973 & 1974)</u>	<u>N = 24</u>		
Means of Return Differences (Test-Control) X 100	-1.17	0.26	-.25
Standard Deviation of Return Differences X 10	.25	.42	.60
t Values	-2.22*	0.3	-.20
$T^2 = 7.02, F = 2.14$			
$\chi^2 (6 \text{ df}) = 9.72 (p = 13.6\%)$			
<u>Test Period: 2 (1974)</u>	<u>N = 12</u>		
Means of Return Differences (Test-Control) X 100	-1.49	-.41	-.22
Standard Deviation of Return Differences X 10	.25	.44	.82
t Values	-2.0**	-.32	-.09
$T^2 = 4.56, F = 1.24$			
$\chi^2 (6 \text{ df}) = 4.45 (p = 61\%)$			
<u>Test Period: 3 (1975)</u>	<u>N = 12</u>		
Means of Return Differences (Test-Control) X 100	1.85	-.14	-.02
Standard Deviation of Return Differences X 10	.40	.31	.24
t Values	1.57	-.15	-.03
$T^2 = 2.49, F = 0.68$			
$\chi^2 (6 \text{ df}) = 11.51 (p = 7.37\%)**$			
<u>Test Period: 4 (1976)</u>	<u>N = 12</u>		
Means of Return Differences (Test-Control) X 100	-3.54	-.64	-1.21
Standard Deviation of Return Differences X 10	.53	.52	.20
t Values	-2.27*	-.42	-2.03**
$T^2 = 11.98, F = 3.26**$			
$\chi^2 (6 \text{ df}) = 4.78 (p = 57.1\%)$			

	<u>.05(*)</u>	<u>.10(**)</u>
F(3,21) =	3.07	2.36
F(3,9) =	3.86	2.81

Note: Chi-square statistic applies to Box test.

TABLE 17 (continued)

C. Results of Tests on Monthly Residuals

	Pc	Ph	Pm
<u>Test Period: 1973 & 1974 vs. 1975 & 1976</u>	<u>N = 24</u>		
Means of Residual Differences (Before-After) X 100	-.14	.12	.42
Standard Deviation of Residual Differences X 10	.59	.50	.42
t Values	-.11	.12	.49
$T^2 = .897, F = .273$			
<u>Test Period: 1974 vs. 1975</u>	<u>N = 12</u>		
Means of Residual Differences (Before-After) X 100	-1.32	-.08	.14
Standard Deviation of Residual Differences X 10	.56	.47	.51
t Values	-.81	-.06	.09
$T^2 = 6.42, F = 1.75$			
<u>Test Period: 1974 vs. 1976</u>	<u>N = 12</u>		
Means of Residual Differences (Before-After) X 100	.95	-.59	.84
Standard Deviation of Residual Differences X 10	.72	.57	.41
t Values	.45	-.35	.70
$T^2 = 2.89, F = .789$			
<u>Test Period: 1975 vs. 1976</u>	<u>N = 12</u>		
Means of Residual Differences (Before-After) X 100	2.27	-.51	.70
Standard Deviation of Residual Differences X 10	.41	.31	.18
t Values	1.92*	-.58	1.29
$T^2 = 14.69, F = 4.0^*$			

	<u>.05(*)</u>	<u>.10(**)</u>
F(3,21) =	3.07	2.36
F(3,9) =	3.86	2.81

the security return behavior of MNC which reversed itself in 1976, leading to similar returns in 1974 and 1976.

As each portfolio (Pc, Ph and Pm) consists of different firms over time, results of Table 16C provide evidence on portfolios of firms using the same accounting method over time. The effect of a change in accounting method over time on a specific set of firms is tested on classification scheme 5, in Table 22.

To determine if the filter on the materiality of exchange adjustments is adequate, all the tests on grouping scheme 1 are repeated with a filter of 4%. Now, the test firms only include MNC that have exchange adjustments that are 4% of income or greater. The number of firms in each portfolio, for each year, are presented in Table 17A. Results of the cross-sectional tests on returns and time-series tests on residuals are presented in Table 17B and 17C respectively. From the tests on returns, the F statistic is found to be weakly significant (10% level) in period 4 only. As in Table 16B, the mean returns for the individual portfolios are predominantly smaller for the test firms vis-a-vis the control firms in Table 17B. The t test indicates that firms using the C method have smaller returns than the control in 1973, 1974 and 1976. As far as the covariance matrix is concerned, the χ^2 statistic is weakly significant (7.3%) in period three only.

From Table 17C, it appears that the tests on residuals are less significant than in Table 16C. The residuals are significantly different only in the comparisons of 1975 versus 1976, when a 4% filter is used on exchange adjustment. Comments on the adequacy and effects of the filter on exchange adjustment are deferred until more evidence is presented with other filter magnitudes.

TABLE 18

Grouping Scheme 2: Accounting Method and CEA^b
Filter = 1%

A. Number of Firms in Each Portfolio in Each Year

Portfolio ^a	'74	'75	'76	Firms
Pci	23	11	1*	
Pcd	48	18	8	
Phi	14	18	3	Test
Phd	43	27	9	
Pmi	10	65	60	
Pmd	33	44	103	
Pci	22	11	1*	
Pcd	48	18	7	
Phi	12	19	4	
Phd	45	27	7	Control
Pmi	10	64	61	
Pmd	33	44	100	

* Returns not usable for comparisons.

^a Defined in Chap. III.

^b CEA = Change in Exchange Adjustment.

Note: FILTER = ABS $\left(\frac{\text{Exch. Adjustment}}{\text{Net Income}} \right)$

TABLE 18 (continued)

B. Results of Tests on Weighted Return Differences

Test Period: 2 (1974)		N = 12					
$T^2 = 14.4,$		$F = 1.31;$		$\chi^2(21 \text{ df}) = 27.77, (p = 14.65\%)$			
		Pci	Pcd	Phi	Phd	Pmi	Pmd
Means of Return Differences							
(Test-Control) X 100		.02	-1.54	.53	-.19	-.99	-.35
Standard Deviation of Return Differences		.42	.33	.79	.45	.81	.66
X 10							
t Values		.02	-1.64	.24	-.15	-.42	-.19
Test Period: 3 (1975)		N = 12					
$T^2 = 13.05,$		$F = 1.186;$		$\chi^2(21 \text{ df}) = 17.67, (p = 66\%)$			
		Pci	Pcd	Phi	Phd	Pmi	Pmd
Means of Return Differences							
(Test-Control) X 100		2.32	.49	-.40	-.04	.50	-.54
Standard Deviation of Return Differences		.41	.27	.62	.31	.16	.25
X 10							
t Values		1.93**	.62	-.23	-.04	1.03	-.73
Test Period: 4 (1976)		N = 12					
$T^2 = 20.56,$		$F = 2.61;$		$\chi^2(15 \text{ df}) = 23.7, (p = 7.03\%)^{**}$			
		Pci	Pcd	Phi	Phd	Pmi	Pmd
Means of Return Differences							
(Test-Control) X 100		---	-2.66	-1.20	1.11	-0.12	-1.37
Standard Deviation of Return Differences		---	.40	.74	.39	.18	.19
X 10							
t Values		---	-2.28*	-.56	.98	-.23	-2.4*
				.05(*)		.10(**)	
		F(6,6) =		4.28		3.05	
		F(5,7) =		3.97		2.88	

Note: Chi-square statistic applies to Box test.

TABLE 18 (continued)

C. Results of Tests on Monthly Residuals

<u>Test Period: 1974 vs. 1975</u>		<u>N = 12</u>				
	<u>Pci</u>	<u>Pcd</u>	<u>Phi</u>	<u>Phd</u>	<u>Pmi</u>	<u>Pmd</u>
Means of Residual Differences (Before-After) X 100	-.59	-1.41	.34	.21	-1.04	.75
Standard Deviation of Residual Differences X 10	.46	.58	.41	.34	.45	.47
t Value	-.44	-.84	.28	.21	-.78	.55
$T^2 = 53.63, F = 4.87^*$						

<u>Test Period: 1974 vs. 1976</u>		<u>N = 12</u>					
		<u>Pci</u>	<u>Pcd</u>	<u>Phi</u>	<u>Phd</u>	<u>Pmi</u>	<u>Pmd</u>
Means of Residual Differences (Before-After) X 100							
	---	.41	-.99	-.03	-1.06	1.58	
Standard Deviation of Residual Differences X 10							
	---	.61	.39	.34	.44	.46	
t Value							
	---	.24	-.87	-.03	-.84	1.19	
$T^2 = 6.45, F = 0.8212$							

<u>Test Period: 1975 vs. 1976</u>		<u>N = 12</u>					
		<u>Pci</u>	<u>Pcd</u>	<u>Phi</u>	<u>Phd</u>	<u>Pmi</u>	<u>Pmd</u>
Means of Residual Differences (Before-After) X 100	---	1.82	-1.33	-.24	-.02	.82	
Standard Deviation of Residual Differences X 10	---	.35	.60	.26	.16	.11	
t Value	---	1.76	-.76	-.31	-.04	2.45*	
$T^2 = 48.73, F = 6.2^*$							

		<u>.05(*)</u>	<u>.10(**)</u>
F(6,6)	=	4.28	3.05
F(5,7)	=	3.97	2.88

Tests on Grouping Scheme 2: Accounting Method and Change in

Exchange Adjustments. In the second classification scheme, firms are grouped into six portfolios by the three accounting methods and the two levels of the variable, Change in Exchange Adjustment (CEA).

Table 18A presents the number of firms in each portfolio in each year. As 1973 was the first year of our data base on firms, the CEA variable could not be calculated for 1973. The first available CEA value was for 1974. Therefore, for grouping scheme 2, no tests were conducted for the first test period (1973 and 1974). In Table 18A, the cells with an asterisk in them indicate the portfolios that were not included in the statistical tests due to inadequate sample size, for the corresponding test periods. Results of the tests on weighted return differences are presented in Table 18B, along with the T^2 , F and χ^2 statistics for each period. The F value is not significant for any of the four test periods, implying that the variable CEA does not improve the partitioning of firms beyond translation methods. More perplexing is the result that the χ^2 statistic is significant at the 7% level in period 4 (1976).

The results of tests on residuals are shown in Table 18C. As in the case of grouping scheme 1, the F statistic is significant for the comparisons of 1974 vs. 1975 and 1975 vs. 1976. Again, there is no significant difference between the residuals of 1974 and 1976.

All the tests on grouping scheme 2 were repeated with a filter of 3% on the exchange adjustment of firms. The number of firms in each portfolio, the results of the cross-sectional tests and the time-series tests are shown in Tables 19A, 19B and 19C respectively. The results

TABLE 19

Grouping Scheme 2: Accounting Method and CEA^b
Filter = 3%

A. Number of Firms in Each Portfolio in Each Year

Portfolio ^a	'74	'75	'76	Firms
Pci	8	7	1*	Test
Pcd	32	13	6	
Phi	6	11	2	
Phd	27	21	9	
Pmi	7	43	37	
Pmd	23	32	82	
Pci	8	7	1*	Control
Pcd	32	13	5	
Phi	5	12	2	
Phd	29	22	7	
Pmi	7	42	37	
Pmd	23	33	82	

* Returns not usable in comparisons.

^aDefined in Chap. III.

^bCEA = Change in Exchange Adjustment.

Note: FILTER = ABS ($\frac{\text{Exch. Adjustment}}{\text{Net Income}}$)

TABLE 19 (continued)

B. Results of Tests on Weighted Return Differences

Test Period: 2 (1974)		N = 12					
$T^2 = 9.77$, $F = 0.88$; χ^2 (21 df) = 37.28, (p = 1.56%)*		Pci	Pcd	Phi	Phd	Pmi	Pmd
Means of Return Differences (Test-Control) X 100		1.03	-1.68	2.5	-.77	-1.45	-.46
Standard Deviation of Return Differences X 10		1.0	.25	1.34	.37	.93	.89
t Values		.35	-2.3*	.64	-.71	-.53	-.17
Test Period: 3 (1975)		N = 12					
$T^2 = 18.3$, $F = 1.66$; χ^2 (21 df) = 22.34, (p = 37.9%)		Pci	Pcd	Phi	Phd	Pmi	Pmd
Means of Return Differences (Test-Control) X 100		.85	.71	.59	-.24	.81	-.70
Standard Deviation of Return Differences X 10		.38	.31	.93	.45	.22	.31
t Values		.76	.79	.23	-.18	1.29	-.76
Test Period: 4 (1976)		N = 12					
$T^2 = 13.7$, $F = 1.75$; χ^2 (15 df) = 20.5, (p = 16.6%)		Pci	Pcd	Phi	Phd	Pmi	Pmd
Means of Return Differences (Test-Control) X 100		---	-3.62	-3.36	1.11	-.53	-1.51
Standard Deviation of Return Differences X 10		---	.54	1.18	.39	.19	.24
t Values		---	-2.32*	-.98	.97	-.95	-2.17**
		.05(*)			.10(**)		
		F(6,6) = 4.28			3.05		
		F(5,7) = 3.97			2.88		

Note: Chi-square statistic applies to Box test.

TABLE 19 (continued)

C. Results of Tests on Monthly Residuals

<u>Test Period: 1974 vs. 1975</u>		<u>N = 12</u>				
	Pci	Pcd	Phi	Phd	Pmi	Pmd
Means of Residual Differences (Before-After) X 100	1.71	-1.96	.06	.23	-1.07	.34
Standard Deviation of Residual Differences X 10	.44	.64	.57	.46	.60	.51
t Values	1.33	-1.05	.03	.17	-.61	.23
$T^2 = 39.14, F = 3.558^{**}$						
<u>Test Period: 1974 vs. 1976</u>		<u>N = 12</u>				
	Pci	Pcd	Phi	Phd	Pmi	Pmd
Means of Residual Differences (Before-After) X 100	---	.35	-1.29	-.01	-1.29	1.43
Standard Deviation of Residual Differences X 10	---	.76	.50	.50	.46	.51
t Values	---	.16	-.88	-.01	-.96	.96
$T^2 = 7.78, F = 0.99$						
<u>Test Period: 1975 vs. 1976</u>		<u>N = 12</u>				
	Pci	Pcd	Phi	Phd	Pmi	Pmd
Means of Residual Differences (Before-After) X 100	---	2.32	-1.35	-.24	-.22	1.08
Standard Deviation of Residual Differences X 10	---	.44	.63	.26	.25	.12
t Values	---	1.82 ^{**}	-.74	-.34	-.30	3.12 [*]
$T^2 = 47.2, F = 6.01^*$						

	<u>.05(*)</u>	<u>.10(**)</u>
F(6,6) =	4.28	3.05
F(5,7) =	3.97	2.88

are basically similar to the results in the 1% filter case. However, as shown in Table 19B, now the χ^2 statistic for the test on covariance of return differences is not significant in period 4, but is significant at the 1% level in period 2. The above result is unexpected, and possibly a chance outcome.

Table 19C shows that in the 3% filter case, the residuals in 1975 are still significantly different from the residuals in 1976 at the 5% level. But for the 1974 vs. the 1975 comparison, the F statistic is now significant at the 10% level instead of the previous 5% level found for the 1% filter case.

At this stage some comments can be made about the effect of varying the magnitude of the filter on the materiality of exchange adjustments. These comments are based on the results of the test on grouping schemes 1 and 2, and not on any formal tests. It seems that a 1% filter provides results generally comparable to the 3% and 4% filters. The effect of increasing the magnitude of the filter on the testing for significant differences in the means of the return distribution vectors was very weak. Only group 1 was affected in test period 4. However, the individual portfolio t values for firms using the C method were affected by changes in the magnitude of the filter in test periods 1-3. The effect on the test statistic (χ^2) used in determining differences in the variances of return distributions was mixed, and one cannot claim any advantage of a larger filter. The effect of a larger filter on the F statistic used in comparing the means of the residual return distributions was to reduce significant differences in the 1974 vs. 1975

comparisons. To sum up, using a 1% filter seems appropriate as it permitted a larger sample size without substantially affecting the outcome of the test results.

Tests on Grouping Scheme 3: Accounting Method and Magnitude of Foreign Revenues. In the third classification scheme, six portfolios are formed by grouping firms by the three accounting methods and the two levels of the magnitude of foreign revenues (FR). The filter used is 1% only. The number of firms in each portfolio for each year is shown in Table 20A. The tests performed are identical to the tests on grouping schemes 1 and 2. The results of the cross-sectional tests are shown in Table 20B and the results of the time-series tests are provided in Table 20C. In Table 20B, the F value is insignificant in each of the four test periods, implying that the means of the return distributions of the test and control firms are not different in either the pre- or post-FASB No. 8 period. The results of Box's χ^2 test tell another story. The χ^2 value is significant at the 5% level in all periods except 1974. In 1974, the χ^2 value is significant at the 6.8% level. The χ^2 test results suggest that MNC grouped by accounting method and magnitude of foreign revenues have return covariances different from that of domestic firms.² We can speculate about the cause of the above results. The fact that the return distributions are different in each of the four periods leads to the suspicion that the implementation of FASB No. 8 is not a factor. Considering the results of grouping scheme 1 and the fact that most firms have shifted from portfolios Pcl and Pcs to Pml and Pms³ with each passing year, it seems that the particular accounting method used may not be an adequate explanation.

TABLE 20

Grouping Scheme 3: Accounting Method and Foreign Revenues
Filter = 1%

A. Number of Firms in Each Portfolio in Each Year

Portfolio ^a	'73	'74	'75	'76	Firms
Pc1	32	38	19	7*	Test
Pcs	30	33	10	2*	
Ph1	19	21	12	5	
Phs	25	36	33	7	
Pm1	19	25	49	70	
Pms	16	18	60	93	
Pc1	32	37	19	7*	Control
Pcs	30	33	10	1*	
Ph1	21	21	12	5	
Phs	26	36	34	6	
Pm1	20	26	50	71	
Pms	15	17	58	90	

*Returns not usable in comparisons for this portfolio.

^aDefined in Chap. III.

Note: FILTER = ABS ($\frac{\text{Exch. Adjustment}}{\text{Net Income}}$)

TABLE 20 (Continued)

B. Results of Tests on Weighted Return Differences

Test Period: 1 (1973 & 1975)		N = 24					
$T^2 = 8.72$, $F = 1.13$;		χ^2 (21 df) = 33.1, (p = 4.4%)*					
		Pc1	Pcs	Ph1	Phs	Pm1	Pms
Means of Return Diffs. (Test-Control) X 100		-1.28	.08	-.18	-.23	-.34	-.41
Standard Deviation of Return Diffs. X 10		.27	.35	.40	.43	.42	.65
t Values		-2.31*	.11	-.22	-.26	-.39	-.31
Test Period: 2 (1974)		N = 12					
$T^2 = 10.84$, $F = 0.98$;		χ^2 (21 df) = 31.3, (p = 6.8%)**					
		Pc1	Pcs	Ph1	Phs	Pm1	Pms
Means of Return Diffs. (Test-Control) X 100		-1.56	-.00	-1.21	.07	-.56	-.03
Standard Deviation of Return Diffs. X 10		.22	.45	.41	.55	.50	.79
t Values		-2.41*	-.00	-1.01	.19	-.36	-.01
Test Period: 3 (1975)		N = 12					
$T^2 = 8.59$, $F = 0.78$;		χ^2 (21 df) = 36.29, (p = 2.0%)*					
		Pc1	Pcs	Ph1	Phs	Pm1	Pms
Means of Return Diffs. (Test-Control) X 100		.90	1.50	.04	-.50	-.15	-.01
Standard Deviation of Return Diffs. X 10		.21	.43	.75	.34	.21	.20
t Values		.14	1.19	.02	-.11	-.25	-.02
Test Period: 4 (1976)		N = 12					
$T^2 = 4.21$, $F = 0.76$;		χ^2 (10 df) = 37.78, (p = 0.01%)*					
		Pc1	Pcs	Ph1	Phs	Pm1	Pms
Means of Return Diffs. (Test-Control) X 100		---	---	-.45	-.87	-.81	-.89
Standard Deviation of Return Diffs. X 10		---	---	.62	.56	.17	.18
t Values		---	---	-.25	-.53	-1.63	-1.64
				.05(*)		.10(**)	
F(6,18) =		2.66		2.13			
F(6,6) =		4.28		3.05			
F(4,8) =		3.84		2.81			

Note: Chi-Square statistic applies to Box test.

TABLE 20 (continued)

C. Results of Tests on Monthly Residuals

Test Period: 1973 & 1974 vs. 1975 & 1976			N = 24			
	Pc1	Pcs	Ph1	Phs	Pm1	Pms
Means of Residual Diffs. (Before-After) X 100	---	---	.21	.13	.14	.61
Standard Deviations of Residual Diffs. X 10	---	---	.45	.34	.53	.26
t Values	---	---	.23	.19	.13	1.12
$T^2 = 1.47, F = 0.32$						
Test Period: 1974 vs. 1975			N = 12			
	Pc1	Pcs	Ph1	Phs	Pm1	Pms
Means of Residual Diffs. (Before-After) X 100	-1.18	-.82	-.50	.64	.17	.39
Standard Deviations of Residual Diffs. X 10	.74	.49	.55	.18	.63	.19
t Values	-.55	-.58	-.31	1.22	.97	.68
$T^2 = 15.7, F = 1.43$						
Test Period: 1974 vs. 1976			N = 12			
	Pc1	Pcs	Ph1	Phs	Pm1	Pms
Means of Residual Diffs. (Before-After) X 100	---	---	-.11	-.56	.49	1.09
Standard Deviations of Residual Diffs. X 10	---	---	.43	.30	.56	.22
t Values	---	---	-.08	-.63	.30	1.67
$T^2 = 4.23, F = 0.77$						
Test Period: 1975 vs. 1976			N = 12			
	Pc1	Pcs	Ph1	Phs	Pm1	Pms
Means of Residual Diffs. (Before-After) X 100	---	---	.39	-1.21	.32	.70
Standard Deviations of Residual Diffs. X 10	---	---	.49	.24	.26	.11
t Values	---	---	.27	-1.68	.41	2.04*
$T^2 = 44.9, F = 8.16^*$						
			<u>.05(*)</u>		<u>.10(**)</u>	
			F(4,20) = 2.87		2.25	
			F(6,6) = 4.28		3.05	
			F(4,8) = 3.84		2.81	

Grouping by the magnitude of foreign revenues seems to be the critical factor. Possibly, the environmental factor of floating exchange rates in the 1973-1977 period affects firms with differential foreign revenues differently. One problem may be the noise in the foreign revenue data. Interpretation of the above results is not straightforward, and some better explanation may be available.

Table 20C shows that in the time series comparison of residuals, the F value is significant at the 1% level in the 1975 versus 1976 comparison, implying that the returns grouped according to scheme 3 were significantly different in the 1976 report period, as compared to the 1975 report period returns. Comparisons in other periods did not show significant results.

Tests on Grouping Scheme 4: Accounting Method and Sign of the Exchange Adjustment. As shown in Chapter III, Table 10, six portfolios are formed by grouping firms according to the three accounting methods and the sign of the aggregate exchange adjustment reported each year. Table 21A gives the number of firms in each portfolio in each year. The results of the cross-sectional tests on risk equalized monthly returns are provided in Table 21B. The table shows the four periods over which comparisons were made. For each period, N is the number of monthly observations used. As can be seen from Table 21B, none of T^2 values are significant for scheme 4. This implies that we cannot reject the hypothesis of no difference between test and domestic firms in any of the four periods. The univariate t values and the means of the return differences do not exhibit any clear pattern. Though the returns of the MNC are lower than the domestic firm returns for most of

TABLE 21

Grouping Scheme 4: Accounting Method and Sign of Exchange
Adjustment (SEA)
Filter = 1%

A. Number of Firms in Each Portfolio for Each Year

Portfolio ^a	'73	'74	'75	'76	Firms
Pc+	45	28	9	1*	Test
Pc-	17	43	20	8	
Ph+	31	19	14	3	
Ph-	13	38	31	9	
Pm+	24	12	53	52	
Pm-	11	31	56	107	
Pc+	45	27	9	1*	Control
Pc-	17	43	20	7	
Ph+	33	17	15	4	
Ph-	14	40	31	7	
Pm+	24	12	50	55	
Pm-	11	31	58	106	

*Returns not usable in comparisons.

^aDefined in Chap. III.

Note: FILTER = ABS $\left(\frac{\text{Exch. Adjustment}}{\text{Net Income}} \right)$

TABLE 21 (continued)

B. Results of Tests on Weighted Return Differences

<u>Test Period: 1 (1973 & 1974)</u>		<u>N = 24</u>					
$T^2 = 9.16, F = 1.194;$		$\chi^2 (21 \text{ df}) = 25.9, (p = 20\%)$					
		Pc+	Pc-	Ph+	Ph-	Pm+	Pm-
Means of Return Diffs. (Test-Control) X 100		-.43	-.65	-.59	.49	-1.19	.55
Standard Deviation of Return Diffs. X 10		.32	.25	.39	.42	.53	.57
t Values		-.65	-1.26	-.75	.57	-1.09	.47
<u>Test Period: 2 (1974)</u>		<u>N = 12</u>					
$T^2 = 15.25, F = 1.38;$		$\chi^2 (21 \text{ df}) = 18.0, (p = 64.3\%)$					
		Pc+	Pc-	Ph+	Ph-	Pm+	Pm-
Means of Return Diffs. (Test-Control) X 100		-.26	-1.45	-.78	-.03	-1.17	-.70
Standard Deviation of Return Diffs. X 10		.39	.18	.43	.52	.70	.68
t Values		-.22	-2.73*	-.62	-.02	-.58	-.50
<u>Test Period: 3 (1975)</u>		<u>N = 12</u>					
$T^2 = 30.49, F = 2.77;$		$\chi^2 (21 \text{ df}) = 28.5, (p = 12.5\%)$					
		Pc+	Pc-	Ph+	Ph-	Pm+	Pm-
Means of Return Diffs. (Test-Control) X 100		1.24	1.20	-1.12	.17	.85	-.79
Standard Deviation of Return Diffs. X 10		.39	.28	.61	.30	.12	.24
t Values		1.09	1.49	-.63	.19	2.37*	-1.11
<u>Test Period: 4 (1976)</u>		<u>N = 12</u>					
$T^2 = 19.1, F = 2.44;$		$\chi^2 (15 \text{ df}) = 24.3**, (p = 5.99\%)$					
		Pc+	Pc-	Ph+	Ph-	Pm+	Pm-
Means of Return Diffs. (Test-Control) X 100		---	-2.66	-.83	-.04	-.20	-1.12
Standard Deviation of Return Diffs. X 10		---	.40	.71	.31	.18	.20
t Values		---	-2.28*	-.40	-.05	-.38	-1.87**
				<u>.05(*)</u>		<u>.10(**)</u>	
F(6,18) =		2.66		2.13			
F(6,6) =		4.28		3.05			
F(5,7) =		3.97		2.88			

Note: Chi-square statistic applies to Box test.

TABLE 21 (continued)

C. Results of Tests on Monthly Residuals

Test Period: 1973 & 1974 vs. 1975 & 1976		N = 24				
	Pc+	Pc-	Ph+	Ph-	Pm+	Pm-
Means of Residual Diffs. (Before-After) X 100.	---	.30	-.04	.81	-.26	.85
Standard Deviation of Residual Diffs. X 10	---	.47	.34	.42	.42	.42
t Values	---	.31	-.06	.94	-.30	.98
$T^2 = 2.39, F = .395$						
Test Period: 1974 vs. 1975		N = 12				
	Pc+	Pc-	Ph+	Ph-	Pm+	Pm-
Means of Residual Diffs. (Before-After) X 100	-.78	-1.36	.52	.15	-.64	.73
Standard Deviation of Residual Diffs. X 10	.60	.55	.39	.35	.49	.45
t Values	-.44	-.84	.45	.15	-.45	.55
$T^2 = 4.09, F = 3.72^{**}$						
Test Period: 1974 vs. 1976		N = 12				
	Pc+	Pc-	Ph+	Ph-	Pm+	Pm-
Means of Residual Diffs. (Before-After) X 100	---	.67	-1.30	.13	-.16	1.24
Standard Deviation of Residual Diffs. X 10	---	.61	.29	.37	.45	.47
t Values	---	.37	-1.50	.12	-.12	.89
$T^2 = 9.76, F = 1.24$						
Test Period: 1975 vs. 1976		N = 12				
	Pc+	Pc-	Ph+	Ph-	Pm+	Pm-
Means of Residual Diffs. (Before-After) X 100	---	.02	-.01	-1.5	.48	.50
Standard Deviation of Residual Diffs. X 10	---	.38	.47	.30	.25	.08
t Values	---	.01	-.01	-1.7	.67	2.08**
$T^2 = 37.9, F = 4.82^*$						

	.05(*)	.10(**)
F(6,6) =	4.28	3.05
F(5,19) =	2.74	2.18
F(5,7) =	3.97	2.88

the portfolio-periods, no inference can be drawn. The results of Box's χ^2 tests on the covariance matrices are also shown in Table 13B. None of the χ^2 values are significant at the 5% level. However, the χ^2 for 1976 is significant at the 5.99% level, implying that the return distributions of the MNC may be different from the return distributions of the matched domestic firms, for the 1976 period.

The results of the time series tests on grouping scheme 4 are shown in Table 21C. The F statistic is significant at the 10% confidence level for the 1974 vs 1975 comparison and significant at the 5% level for the 1975 vs 1976 comparison. This implies that the hypothesis of no difference in returns over time can be rejected for the 1975-1976 period.

Tests on Grouping Scheme 5: By Accounting Method Used in Pre-FASB No. 8 Period. Results of the tests on return residuals (U_{it}) on grouping scheme 5 are shown in Table 22B. In this table, residuals of test firms are compared in the before and after FASB No. 8 periods to see if there is any effect of the accounting change. Table 10, Chapter III shows that portfolios Pcm and Phm consist of those firms that were using the C and H accounting methods, respectively, and switched to the M method after FASB No. 8. Portfolio Pcm consists of firms that used the M method before and after FASB No. 8. Also, it is worth emphasizing that, as opposed to grouping schemes 1 through 4, in scheme 5 each portfolio consists of the same firms in each period. The number of firms in each portfolio is shown in Table 22A. Apart from comparing the residuals for the aggregate period of 1973 and 1974 vs 1975 and 1976, comparisons are also made between 1974 vs 1976 and 1975 vs 1976.

TABLE 22

Grouping Scheme 5: By Accounting Method Used In
Pre-FASB No. 8 Period

A. Number of Firms in Each Portfolio*

<u>Portfolio^a</u>	<u>Test Firms</u>
Pcm	81 (79)
Phm	66 (64)
Pmm	55 (55)

*The number of firms with data for the tests on financial ratios (Tables 26 and 27) are shown in parentheses.

^aDefined in Chap. III.

TABLE 22 (continued)

B. Results of Tests on Monthly Residuals

	Pcm	Phm	Pmm
<u>Test Period: 1973 & 1974 vs. 1975 & 1976 N = 24</u>			
Means of Residual Differences (Before-After) X 100	.98	.64	.69
Standard Deviations of Residual Differences X 10	.40	.28	.31
t Values	1.19	1.09	1.06
$T^2 = 1.67, F = 0.510$			
<u>Test Period: 1974 vs. 1975 N = 12</u>			
Means of Residual Differences (Before-After) X 100	.40	.42	.66
Standard Deviations of Residual Differences X 10	.42	.27	.32
t Values	.32	.54	.70
$T^2 = 0.559, F = 0.152$			
<u>Test Period: 1974 vs. 1976 N = 12</u>			
Means of Residual Differences (Before-After) X 100	.80	.75	.99
Standard Deviations of Residual Differences X 10	.46	.27	.28
t Values	.59	.94	1.23
$T^2 = 1.66, F = 0.454$			
<u>Test Period: 1975 vs. 1976 N = 12</u>			
Means of Residual Differences (Before-After) X 100	.39	.33	.33
Standard Deviations of Residual Differences X 10	.23	.13	.15
t Values	.59	.86	.74
$T^2 = 0.92, F = 0.251$			

	<u>.05(*)</u>	<u>.10(**)</u>
F(3, 21) = 3.07		2.36
F(3,9) = 3.86		2.81

The reason is to capture any short-term effect of the accounting change that could have occurred in 1975 or 1976. As shown in Table 5 most of the accounting changes were evenly divided between 1975 and 1976, so the above comparisons seem warranted. In each of the four test periods, the value of the T^2 statistic is not significant. Also, for all periods, the t value for each of the three portfolios is insignificant at the 5% level. The means of residuals for all three portfolios are lower in 1976 over 1975, and in 1975 over 1974, but the differences are not significant. On the basis of these results, we cannot reject the hypothesis of no information content of the accounting change. In other words, both for firms that changed the method for translation and for firms that did not, the average residual returns were not significantly different in the post-FASB No. 8 and pre-FASB No. 8 period. As firms in portfolio Pmm were using the M method all along, no significant differences should be expected for portfolio Pmm. So, including Pmm in the multivariate comparisons may have biased the results somewhat.

The above results are opposite to the results of the time-series tests on residuals for grouping schemes 1 through 4. If betas of the test firms have not shifted, these results are perhaps a more powerful indication of the absence of effects on security returns.

Tests on Grouping Scheme 6: Action/No Action/ Domestic Firms.

The results of no difference in the "before" (1973-1974) period confirms our expectation that firms using alternative accounting methods for translations are not valued differently, at least as far as mean returns are concerned. The result for the "after" period could mean

TABLE 23
Grouping Scheme 6: Action/No Action/Domestic Firms
by Accounting Method

A. Number of Firms in Each Portfolio

	<u>Portfolio^a</u>	<u>Number of Firms</u>
<u>Action firms</u>	Ac	22
	Ah	17
	Am	10
<u>No-action firms*</u>	NAc	23
	NAh	16
	NAm	11

* When domestic firms are used as the control, the number of firms in each of three corresponding portfolios are the same.

^aDefined in Chap. III.

TABLE 23 (continued)

B. Action Firms vs No Action as Control Firms
Results of Tests on Weighted Return Differences

	Ac	Ah	Am
<u>Test Period 1 (1973 & 1974)</u>	<u>N = 24</u>		
$T^2 = 2.15, F = 0.65; \chi^2 (6 \text{ df}) = 5.4, (p = 49\%)$			
Means of Return Differences (Action-No Action) X 100	- .70	0.08	-.46
Standard Deviation of Return Differences X 10	.24	.25	.60
t Values	-1.41	1.65	-.37
<u>Test Period 2 (1974)</u>	<u>N = 12</u>		
$T^2 = 1.362, F = .371; \chi^2 (6 \text{ df}) = 2.6, (p = 85\%)$			
Means of Return Differences (Action-No Action) X 100	-.32	.71	.67
Standard Deviation of Return Differences X 10	.24	.31	.73
t Values	-.46	.77	.31
<u>Test Period 3 (1975)</u>	<u>N = 12</u>		
$T^2 = 4.86, F = 1.32; \chi^2 (6 \text{ df}) = 4.93, (p = 55\%)$			
Means of Return Differences (Action-No Action) X 100	1.09	1.72	-2.65
Standard Deviation of Return Differences X 10	.42	.41	.72
t Values	.89	1.44	-1.27
<u>Test Period 4 (1976)</u>	<u>N = 12</u>		
$T^2 = 4.8, F = 1.309, \chi^2 (6 \text{ df}) = 2.87, (p = 82\%)$			
Means of Return Differences (Action-No Action) X 100	.35	1.70	-1.03
Standard Deviation of Return Differences X 10	.20	.30	.47
t Values	.60	1.92	-.76
	$\frac{.05(*)}{F(3,21) = 3.07}$	$\frac{.10(**)}{2.36}$	
	$F(3,9) = 3.86$	2.81	

Note: Chi-square statistic applies to Box test.

TABLE 23 (continued)

C. Action Firms vs Domestic Firms as Control Firms
Results of Tests on Weighted Return Differences

	Ac	Ah	Am
<u>Test Period: 1 (1973 & 1974)</u>	<u>N = 24</u>		
$T^2 = 3.63, F = 1.1; \chi^2 (6 \text{ df}) = 7.7, (p = 26\%)$			
Means of Return Differences (Action-Domestic) X 100	-.72	.99	.73
Standard Deviations of Return Differences X 10	.38	.75	.71
t Values	-.91	.64	.50
<u>Test Period: 2 (1974)</u>	<u>N = 12</u>		
$T^2 = 10.11, F = 2.75; \chi^2 (6 \text{ df}) = 7.2, (p = 29\%)$			
Means of Return Differences (Action-Domestic) X 100	-1.85	1.23	1.66
Standard Deviations of Return Differences X 10	.38	.95	.79
t Values	-1.66	.44	.72
<u>Test Period: 3 (1975)</u>	<u>N = 12</u>		
$T^2 = 4.11, F = 1.12; \chi^2 (6 \text{ df}) = 8.9, (p = 18\%)$			
Means of Return Differences (Action-Domestic) X 100	1.77	-.19	-1.91
Standard Deviations of Return Differences X 10	.41	.46	.65
t Values	1.47	-.14	-1.01
<u>Test Period: 4 (1976)</u>	<u>N = 12</u>		
$T^2 = 1.96, F = .5351; \chi^2 (6 \text{ df}) = 5.7, (p = 45\%)$			
Means of Return Differences (Action-Domestic) X 100	.08	.73	-.62
Standard Deviations of Return Differences X 10	.24	.43	.26
t Values	.12	.58	-.82
	<u>.05(*)</u>	<u>.10(**)</u>	
F(3,21) =	3.07	2.36	
F(3,9) =	3.86	2.81	

Note: Chi-square statistic applies to Box test.

two things. Either behavioral reaction by management is not widespread enough to systematically affect the economic values of firms, or the testing procedure, by aggregating across firms, could be making different effects on firms undetectable. More refined grouping of scheme 6 was used to overcome this ambiguity. Results of the tests on monthly returns on grouping scheme 6 are shown in Tables 23B and 23C. A total of 51 firms that supposedly took action against accounting risk (Action) were identified and grouped by accounting method in the pre-FASB No. 8 period. The number of firms in each portfolio, for which continuous return data were available on the CRSP tape, are shown in Table 23A for the Action firms and the matched No Action and domestic firms. In the tests on grouping scheme 6, two different control groups are used: the No Action firms and the domestic firms. The results of the tests for the Action vs No Action firms are shown in Table 23B. The results of the T^2 test and the χ^2 are insignificant in each of the test periods. Based on this result we cannot reject the hypothesis of no difference in the return distributions of the Action and No Action group of firms.

Comparison with the No Action firms suggests that the hypothesized behavioral reaction by managers is not significantly affecting the economic value of the Action firms to have a measurable impact on the stock price returns of those firms. Of course, one problem with the above results could be that the firms in the No Action group are not truly those that took no action against accounting risk, and then the No Action group would show similar returns as the Action group. Another problem could be that the effect on the security price returns

TABLE 24
Summary Results of Tests on Security Price Returns

GROUPING SCHEME	Grouping 1		Grouping 2	
	Atg. Method		Atg. Method & CEA ^a	
FILTER ^d	1%	4%	1%	3%

TESTS ON WEIGHTED TOTAL RETURNS

(1) Equality of Means - F statistic

Test period 1 (73 & 74) :	ns	ns	--	--
Test period 2 (1974) :	ns	ns	ns	ns
Test period 3 (1975) :	ns	ns	ns	ns
Test period 4 (1976) :	ns	10%	ns	ns

(2) Equality of Covariance Matrices - χ^2 statistic

Test period 1 (73 & 74) :	6.2%	ns	--	--
Test period 2 (1974) :	ns	ns	ns	1.51
Test period 3 (1975) :	ns	7.3%	ns	ns
Test period 4 (1976) :	7.5%	ns	7%	ns

TESTS ON AVERAGE MONTHLY RESIDUALS

Equality of Means - F statistic

(73 & 74) vs (75 & 76) :	ns	ns	--	--
74 vs 75 :	10%	ns	5%	10%
74 vs 76 :	ns	ns	ns	ns
75 vs 76 :	5%	5%	5%	5%

Note: Numbers are significant level of test results.

ns = nonsignificant results, with p greater than 10%

^aCEA=Change in Exchange Adjustment.

^dFILTER = ABS ($\frac{\text{Exchange Adjustment}}{\text{Net Income}}$)

TABLE 24 - EXTENDED

Grouping 3 Atg. Method & FR ^b	Grouping 4 Atg. Method & SEAC ^c	Grouping 5 Pre-FASB No. 8 Method	Grouping 6	
1%	1%	1%	Action/ No Action	Action/ Domestic
			--	--
ns	ns	--	ns	ns
ns	ns	--	ns	ns
ns	ns	--	ns	ns
ns	ns	--	ns	ns
4.4%	ns	--	ns	ns
6.8%	ns	--	ns	ns
2.0%	ns	--	ns	ns
0.01%	5.9%	--	ns	ns
ns	ns	ns	--	--
ns	10%	ns	--	--
ns	ns	ns	--	--
5%	5%	ns	--	--

^bFR = Magnitude of Foreign Revenues

^cSEA = Sign of Exchange Adjustments

of individual firms is being averaged out for the total portfolio. More reliable results are probably obtained by using the domestic firms as the control group.

The results of the comparisons between the Action and domestic firms are shown in Table 23C. The results of the T^2 test and the χ^2 test, and the univariate t values are insignificant for all the test periods. These results provide evidence that behavioral reaction by managers is not systematically affecting the security returns of Action firms in the post-FASB No. 8 period.

Evaluation of Tests on Security Price Returns. The results of tests on grouping schemes 1 through 6 that were significant at the 5% confidence level are summarized in Table 25 and evaluated for each of the four test periods. From these results, it is clear that the means of total return distributions are not significantly different for the test and control firms for any of the grouping schemes, in both the pre- and post-FASB No.8 periods. This result falls into cell 1 of Table 13, shown in Chapter III. Therefore, one cannot reject the null hypothesis of no effect due to FASB No. 8, as measured by the means of the security return distributions of MNC. This result is consistent with the findings of Dukes.

However, the results of the tests on the variance of the return distributions and the time-series tests on average residuals are not so clear. First, some general implications of these results of tests on variances are discussed. Then the implications for each test period are mentioned.

Test on Variance of Security Return Distributions. The tests on grouping scheme 3 (by accounting method and size of foreign revenues-Table 20B) show significant results for the χ^2 statistic in all the test periods. It seems unlikely that these results are due to random chance. If the results of the χ^2 test for grouping scheme 3 are considered along with the few other significant values of χ^2 , then we must place the outcome of the tests for variance of security returns in cell 4 of Table 13 i.e. covariances of security returns are affected in both the pre- and post-FASB NO. 8 periods. If the results of the χ^2 tests on grouping 3 are ignored, then the results of the remaining χ^2 tests place the outcome of tests for variance in cell 1 of Table 13. That is, variances of the security returns of test firms are not different from the variances of security returns of control firms, in any test period. It is felt that the second course is more appropriate here. There seems to be some systematic bias associated with the magnitude of foreign revenues that is causing a structural difference between the covariance matrices of test and control firms. The investigation of this bias is an interesting topic for future research. The results of each test period are now further evaluated.

In the first test period (1973 & 1974), the χ^2 statistic was significant at the 10% level for grouping scheme 3 and scheme 1 with 1% filter, as mentioned earlier. Two competing explanations are possible. Market agents could be naively valuing firms based on the magnitude of the alternative exchange adjustments reported under the

TABLE 25

Tests on Security Returns: Summary
of Results Significant at the 5% Level by Test Period

<u>Grouping Scheme</u>	<u>Tests on</u>	<u>Moment</u>	<u>Statistic</u>	<u>Remarks</u>
<u>Test Period 4 (1976)</u>				
1: Atg. Method, 4% filter residuals		mean	F	1975 vs 1976
1: Atg. Method, 1% filter residuals		mean	F	1975 vs 1976
2: CEA, 3% filter	residuals	mean	F	1975 vs 1976
2: CEA, 1% filter	residuals	mean	F	1975 vs 1976
3: F. Revenue	residuals	mean	F	1975 vs 1976
4: SEA	residuals	mean	F	1975 vs 1976
3: F. Revenue	returns	variance	χ^2	p = .01%
<u>Test Period 3 (1975)</u>				
2: CEA, 1% filter	residuals	mean	F	1974 vs 1975
3: F. Revenue	returns	variance	χ^2	p = 2%
<u>Test Period 2 (1974)</u>				
2: CEA, 3% filter	returns	variance	χ^2	p = 1.5%
3: F. Revenue	returns	variance	χ^2	p = 6.8%
<u>Test Period 1 (1973 & 1974)</u>				
3: F. Revenue	returns	variance	χ^2	p = 4.4%
1: Atg. Method, 1% filter	returns	variance	χ^2	p = 6.2%

Note: CEA = Change in Exchange Adjustments.

SEA = Sign of Exchange Adjustments.

FILTER = ABS $\left(\frac{\text{Exchange Adjustment}}{\text{Net Income}} \right)$

different translation methods. Alternatively, some uncontrolled variable that is correlated with translation methods could be systematically affecting the security returns of MNC. The second explanation seems more plausible.

In test period 2 (1974), grouping scheme 2 with 3% filter has a χ^2 statistic significant at the 1.5% level. Nineteen seventy-four was the first year for which tests on this grouping scheme was conducted. One explanation for the strong result on scheme 2 is that 1974 was probably the first year that MNC made adequate disclosures about foreign currency translations, in response to FASB No. 1.

Alternatively, the result could be due to random chance. Test period 3 (1975) was the first post-FASB No. 8 period. The test results on the variance of returns were not substantially different in period 3 over periods 1 and 2. In test period 4 (1976), the χ^2 value was significant for grouping scheme 3 at the 0.01% level, and significant at the 10% level for schemes 1, 2, and 4 for the 1% filter case. This evidence does seem somewhat different from that on previous periods and prompts the conclusion that the variance of return distributions of MNC were incrementally affected in 1976. Barring a better explanation, one inference is that the implementation of FASB No. 8 may have been associated with differences in return distributions of MNC and control firms.

Finally, none of the tests on security returns conducted on grouping scheme 6 (Action/No Action firms) were significant. So, we cannot reject the null hypothesis of no difference in security return distributions of Action and No Action firms in the 1973-1976 period.

One conclusion is that managerial reaction to FASB No. 8 was not extensive enough to significantly affect the economic values of firms, as measured by security price returns. A competing explanation is that the methodology used was not sensitive enough to detect any effect of managerial reaction, or that our grouping technique was "washing out" any effect on return distributions.

Tests on Means of Residuals. As mentioned earlier, none of the comparisons on grouping scheme 5 (by accounting method in pre-FASB No. 8 period) had significant results. That is, when residual returns of portfolios with the same set of firms were compared before and after the accounting change, no statistical difference was detected. However, when firms are grouped by schemes 1-4, tests on average residual returns produce different results.

The significant results of the time series tests on grouping schemes 1, 2, 3, and 4 are summarized in Table 25. These results lead to the conclusion that when portfolios using the same translation method (and associated variable) were compared over time, no permanent change on stock prices could be detected. However, Table 25 shows that the residuals were significantly different between 1975 and 1976 for grouping schemes 1 through 4. The conclusion is that security return distributions of MNC, as measured by means of residuals, were affected in 1976. In comparing the residuals of 1974 with 1975, the evidence leads to the conclusion that the means of residuals were also affected in 1975, though not as strongly as in 1976.

Effect on Financial Structure of Firms

The financial structure of firms before and after FASB No. 8 was studied for grouping scheme 5 (firms by change/no change in accounting method) and for grouping scheme 6 (Action/No Action/domestic firms). The financial structure was operationally measured by the inventory, long term asset, current liability and long term debt accounts for the balance sheet, and net income and revenue for the income statement, scaled in each case by the total asset level. The balance sheet and income statement accounts were compared separately. For tests on grouping scheme 5, the number of firms for which ratio data were available is shown in Table 22 in parentheses. No data were available for two firms in portfolio Pcm and portfolio Phm. The results of all the tests on the financial structure of firms are summarized in Table 29.

The results of the cross-sectional comparisons for scheme 5 are shown in Table 26. Comparisons were made for the pre and post-FASB No. 8 period to see if the three portfolios had similar structures in the two periods. The average value of the ratio differences for the two-year test period (annual data) are shown, along with the standard deviations and the t-values. In multivariate comparisons, only two groups (each with p attributes) can be compared at a time. So, comparisons of portfolios Pcm vs. Phm and Pcm vs. Pmm were made separately. As the number of firms (observations) are not equal in the three portfolios, the number of firms from the smaller portfolios, were used in the pairwise comparisons. For the balance sheet, the four ratios were

compared simultaneously, and for the income statement, the two ratios were compared simultaneously. From the results of the T^2 test, it seems that the balance sheet is not significantly different for the three portfolios in both the pre- and post-FASB No. 8 periods. In the income statement, the only T^2 value significant at the 10% level is for the Pcm versus Phm comparison in the 1976 and 1977 period. From the t value, it appears that the income of the Phm portfolio was significantly higher than the income of the Pcm portfolio. The test results are not strong enough to claim that the financial structure of the Phm firms had become different from the structure of Pcm and Pmm firms in the 1976 and 1977 period.

Time Series tests were also made for each portfolio, to see if the structure of any particular portfolio had changed after the implementation of FASB No. 8. The average ratios for 1973 and 1974 were compared with the average ratios for 1976 and 1977 for each portfolio. The results are provided in Table 27. From the values of the T^2 test, one cannot conclude any change in the structure of the balance sheets for any portfolio. The tests on the income statement show that the T^2 value is significant for the Pcm and Pmm portfolios. In the 1976 and 1977 period, both return on investment (Net Income/Total Assets) and asset turnover (Revenue/Total Assets) are higher for the Pmm portfolio, though only asset turnover is significant at the 5% level. The same trend exists for the Phm portfolio though the differences are not significant. For the Pcm portfolio, the asset turnover is higher in the 1976 and 1977 period, and the return on investment is significantly lower.

Over time, some increase in the income and revenue numbers is expected, under normal conditions. However, there is no reason to expect a substantial change in the asset turnover or the return on investment. The maximum increase of 0.059 in the asset turnover, while statistically significant, does not seem to be exceptional. Also, the average increase in the return on investment of 2.0% and 0.83% for Phm and Pmm portfolios respectively does not seem to be very high. The decrease in the return on investment of 0.73% for the Pcm portfolio does call for a comment. This decrease may just reflect a slight decrease in profitability of the Pcm firms, or it may be a result of the accounting changes required by FASB No. 8.

To sum up, the results of the cross-sectional tests and the time-series tests together do not lead one to believe that a significant change in the financial structure has occurred for any of the three portfolios of firms. Of course, significant structural changes in a subset of the firms may be becoming swamped by the rest of the firms. To check for this eventuality, the financial ratios of the Action group of firms were compared with the ratios of the No Action and domestic group of firms. The approach used was the same as for the tests on grouping scheme 5. Only cross-sectional comparisons were made, however.

The results of the comparisons between the Action and No Action firms are shown in Table 28A. From the values of the T^2 statistic, we cannot reject the hypothesis of no difference in the financial structure of the two groups in either time period.

TABLE 26

Grouping Scheme 5: By Accounting Method in Pre-FASB No. 8 Period
 Results of Comparisons of Financial Ratios: Cross-sectional Tests

PORTFOLIO:		Pcm vs Phm			
ITEM	N ^a	L.T. Debt	Inventory	Fixed Assets	Current Liability

BALANCE SHEET RATIOS

Test Period: 1973 & 1974

Means of Ratio					
Differences X 10	64	0.13	-0.45	0.54	-0.20
Standard Deviation					
of Ratio Differences	64	0.12	0.20	0.18	0.10
t values	64	0.86	-1.76**	2.40*	-1.65
$T^2 = 7.43, F = 1.76$					

Test Period: 1976 & 1977

Means of Ratio					
Differences X 10	64	-0.05	-1.00	0.68	-0.34
Standard Deviation					
of Ratio Differences	64	0.13	0.37	0.19	0.14
t values	64	-0.31	-2.13*	2.73*	-1.92**
$T^2 = 8.1, F = 1.93$					

INCOME STATEMENT RATIOS

ITEM	N	Net Income	Revenue
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Test Period: 1973 & 1974

Means of Ratio			
Differences X 10	64	-0.03	-0.53
Standard Deviation			
of Ratio Differences	64	0.04	0.98
t values	64	-0.59	-0.43
$T^2 = 0.70, F = 0.34$			

Test Period: 1976 & 1977

Means of Ratio			
Differences X 10	64	-0.30	-0.14
Standard Deviation			
of Ratio Differences	64	0.11	0.85
t values	64	-2.21*	-0.13
$T^2 = 4.89, F = 2.40**$			

$$F(2,60) = \frac{.05(*)}{3.15} = 2.53$$

$$F(4,60) = \frac{.10(**)}{2.39} = 2.04$$

^aN = No. of firms

TABLE 26 - EXTENDED

Pcm vs Pmm				
<u>N</u>	<u>L.T. Debt</u>	<u>Inventory</u>	<u>Fixed Assets</u>	<u>Current Liability</u>
55	0.23	-0.52	0.52	-0.20
55	0.17	0.21	0.21	0.90
55	1.03	-1.84**	1.76**	-1.63
$T^2 = 6.55, F = 1.54$				
55	0.19	-0.75	0.58	-0.15
55	0.16	0.30	0.23	-0.12
55	0.86	-1.85	2.00*	0.89
$T^2 = 5.32, F = 1.25$				
<u>N</u>	<u>Net Income</u>		<u>Revenue</u>	
55	-0.04		0.86	
55	0.04		0.57	
55	-0.69		1.11	
$T^2 = 1.93, F = 0.95$				
55	-0.18		0.81	
55	0.08		0.60	
55	-1.66		0.99	
$T^2 = 4.26, F = 2.09$				

TABLE 27

Grouping Scheme 5: By Accounting Method in Pre-FASB No. 8 Period
Results of Comparisons of Financial Ratios: Time Series Tests

Port- folio	N ^a	Means of Ratio Differences (Before - After) X 100				Standard Deviation of Ratio Differences X 10				t Value				T ²	F
		C.		L.T.		C.		L.T.		C.		L.T.			
		Inv.	Liab.	Debt	Assets	Inv.	Liab.	Debt	Assets	Inv.	Liab.	Debt	Assets		
		BALANCE SHEET RATIOS													
Pcm	79	-0.10	0.74	-0.54	-0.32	0.92	0.45	0.68	0.45	-0.10	1.45	-0.70	-0.63	2.20	0.52
Phm	64	-5.01	-1.09	-2.29	0.80	3.07	0.91	1.05	0.54	-1.30	-0.95	-1.74	1.18	3.54	0.84
Pmm	55	-2.13	0.82	-0.38	0.00	1.96	0.65	0.78	0.51	-0.80	0.93	-0.35	0.00	2.82	0.56

INCOME STATEMENT RATIOS

Port- folio	N	Income		Revenue		Income		Revenue		T ²	F		
		C.		L.T.		C.		L.T.					
		Inv.	Liab.	Debt	Assets	Inv.	Liab.	Debt	Assets				
Pcm	79	0.73	-5.89			0.32	1.68			2.01*	-3.11*	20.0	9.87*
Phm	64	-2.63	-1.78			1.11	4.01			-1.45	-0.35	4.60	2.27
Pmm	55	-0.83	-5.95			0.68	1.67			-0.90	-2.64*	8.35	4.09*

Note: Each Ratio Difference = $1/2$ (1973 + 1974 - 1976 + 1977)
Test Period = (1973 & 74) vs (1976 & 77)

$$\begin{aligned} & .05(*) \\ & F(2,60) = 3.15 \\ & F(4,60) = 2.53 \end{aligned}$$

aN = No. of Firms

TABLE 28

Results of Comparisons of Financial Ratio: Cross Sectional Tests

A. Action Firms vs No Action Firms as Control

Period	Na	Means of Ratio				Standard Deviation of				t Value				T ²	F
		Differences X 100				Ratio Differences									
		L.T.	Inv.	Asset	C.	L.T.	Inv.	Asset	C.	L.T.	Inv.	Asset	C.		
		Debt			Liab.	Debt			Liab.	Debt			Liab.		
BALANCE SHEET RATIOS															
73 & 74	51	4.50	0.53	0.71	-0.16	0.17	0.21	0.20	0.12	1.86**	0.17	0.24	-0.09	3.77	0.88
76 & 77	51	1.61	-4.28	1.20	0.33	0.19	0.53	0.21	0.17	0.60	-0.57	0.39	0.13	1.91	0.44

BALANCE SHEET RATIOS

INCOME STATEMENT RATIOS

		Income		Revenue		Income		Revenue		T ²	F
		Income	Revenue	Income	Revenue	Income	Revenue				
73 & 74	51	-1.12	-19.13	0.05	0.89	-1.52	-1.52	3.82	1.87		
76 & 77	51	-1.72	-23.20	0.16	0.89	-0.75	-1.84**	4.05	1.98		

an = No. of Firms

.05(*)

.10(**)

F(2,60)

= 3.15

2.39

F(4,60)

= 2.53

2.04

TABLE 28 (continued)

B. Action Firms vs Domestic Firms as Control

Period	Na	Means of Ratio Differences X 100				Standard Deviation of Ratio Differences				t Value				T ²	F
		L.T.	Inv.	Asset	Liab.	L.T.	Debt	Inv.	Asset	Liab	L.T.	Debt	Inv.	Asset	C. Liab
73 & 74	49	3.00	-4.71	-0.63	2.47	0.22	0.24	0.24	0.24	0.13	0.94	-1.36	-0.18	1.29	1.37
76 & 77	49	1.48	-10.10	-0.30	3.24	0.22	0.56	0.27	0.21	0.21	0.45	-1.25	-0.01	1.07	3.43*

BALANCE SHEET RATIOS

INCOME STATEMENT RATIOS

Period	Na	Income		Revenue		Income		Revenue		Income		Revenue		T ²	F
		Income	Revenue	Income	Revenue	Income	Revenue	Income	Revenue	Income	Revenue	Income	Revenue		
73 & 74	49	0.14	-15.14	0.06	0.90	0.06	0.90	0.15	-1.17	0.15	-1.17	1.47	0.72	1.47	0.72
76 & 77	49	-2.03	-14.40	0.17	0.99	0.17	0.99	-0.80	-1.01	-0.80	-1.01	1.64	0.80	1.64	0.80

an = No. of Firms

.05(*)

F(2,40) = 3.23

F(4,40) = 2.61

.10(**)

2.44

2.09

TABLE 29

SUMMARY RESULTS OF TESTS ON FINANCIAL STRUCTUREA. CROSS-SECTIONAL TESTS

<u>Grouping Scheme Portfolio</u>	<u>Grouping Scheme 5</u>		<u>Grouping Scheme 6</u>	
	<u>Pcm vs Phm</u>	<u>Pcm vs Phm</u>	<u>Action vs No Action</u>	<u>Action vs Domestic</u>
(1) <u>Balance Sheet Ratios</u>				
Test Period: (1973 & 1974)	ns	ns	ns	ns
Test Period: (1976 & 1977)	ns	ns	ns	5%
(2) <u>Income Statement</u>				
Test Period: (1973 & 1974)	ns	ns	ns	ns
Test Period: (1976 & 1977)	10%	ns	ns	ns

B. TIME SERIES TESTS

	<u>Grouping Scheme 5</u>			<u>Grouping Scheme 6</u>	
	<u>Pcm</u>	<u>Phm</u>		<u>Pcm</u>	<u>Pmm</u>
(1) <u>Balance Sheet</u>					
Test Period: (73 & 74) vs (76 & 77)	ns	ns	ns	ns	ns
(2) <u>Income Statement</u>					
Test Period: (73 & 74) vs (76 & 77)	1%	ns	ns	5%	5%

Note: The numbers are the significance levels on F tests
 ns = nonsignificant results, with p greater than 10%

The results of the comparisons between Action and domestic firms are shown in Table 28B. The balance sheet of the two groups is similar in 1973 and 1974, but in 1976 and 1977, the balance sheet ratios are significantly different. This result leads one to conclude that the financial structure of the Action firms had been significantly affected in the post-FASB No. 8 period. The T^2 values for the comparisons of the income statement ratios are insignificant for both periods. To sum up, it seems that while profitability has not been affected, the financial structure of Action firms has become significantly different from that of domestic firms. The result of no difference in the financial structure of Action firms has become significantly different from that of domestic firms. The result of no difference in the financial structure of Action and No Action firms, coupled with the previous evidence from tests on stock price returns, leads to the suspicion that a truly No Action group of firms has not been obtained.

Notes

1. We can get 17-18 points before FASB No. 8, but income numbers more than five years before FASB No. 8 may be contaminated by other influences. Quarterly numbers are also useless due to inherent variability in those numbers.
2. The correlation matrices of the test and control firms were essentially similar for test periods 1-3. In 1976, the test firm portfolios had higher correlations than the control firm portfolios. The actual correlation matrices are not presented here.
3. See Table 20A for the number of firms in each portfolio.

CHAPTER V SUMMARY AND CONCLUSIONS

In Chapter I, the research problem was introduced and the research objectives were stated. The research objective was to investigate the effects of the issuance and adoption of FASB No. 8 on: (1) the security price behavior of MNC and (2) the financial structure of MNC. An ancilliary objective was to provide descriptive statistics on the translation methods, distribution of reported exchange adjustments and volatility of income of the MNC in our sample.

Conceptual Issues. Some conceptual issues in foreign currency translations were discussed in Chapter II. The alternative reporting methods for translation of foreign financial statements were described and compared. They are: (1) current/noncurrent, (2) hybrid method, (3) monetary/nonmonetary, and (4) temporal method. It was pointed out that under historical cost accounting methods (3) and (4) are essentially similar and the two methods were assumed equivalent in this study. The requirements under two financial pronouncements--FASB No. 1 and FASB No. 8--were summarized, and it was assumed that for many firms data on translation methods were first disclosed to the market in 1974, when FASB No. 1 became effective.

Accounting and economic risk (exposure) were also defined. Accounting risk was defined as the translation effect of an exchange rate change on reported income. Assets and liabilities of a firm that are translated at current exchange rates are "exposed" in an accounting sense. Economic exposure was defined as the effect of an exchange

rate change on the future cash flows of a firm, but no operational definition for the measurement of the economic risk faced by a firm was provided.

The possible effects of FASB No. 8 on investor behavior and management behavior and their implications for security returns and the financial structure of MNC were then discussed. The translation method required by FASB No. 8 (1) does not reflect the economic exposure faced by a firm and (2) is claimed to increase the volatility of reported earnings. Critics have implied that investors become confused and are unable to correctly assess the distribution of future values of firms' securities. An informationally efficient capital market was assumed in this research, under which the accounting change required under FASB No. 8 was not expected to have any effect, in the aggregate, on security returns of MNC.

FASB No. 8 may influence management behavior if managers believe that capital markets are inefficient or if their reward structure is linked to the earnings reported under FASB No. 8. Consequently, if managements expend real resources to neutralize the effects of FASB No. 8, the security returns and financial structure of the corresponding firms may be affected.

Finally, FASB No. 8 may have an impact on the security returns of MNC if new disclosures, pertinent to valuing firms, were released to the market after its implementation. It was assumed that no such new disclosures were required by FASB No. 8.

Research Design. Five general hypotheses, dealing with the supposed effects of FASB No. 8 on security return distributions and the financial structure of firms were first presented. The research design and methodology were then presented in Chapter III. Two methods were used to evaluate the effects of FASB No. 8 on security return distributions. The first method (called cross-sectional tests) consists of cross-sectional comparisons of the means and covariance matrices of the relative risk equalized total returns of the test and control firms. The second method (called time-series tests) consists of the comparison of average residual returns of the test firms over two periods. The market model was used to obtain the relative risk for the first method and the average residuals for the second method. The value weighted market index and common stock returns with dividends were used throughout. In both test methods, multivariate comparisons on the vectors of returns (or residual returns) for various test portfolios were made. Hotelling's T^2 test was used to check for mean differences and Box's χ^2 test was used for differences in covariance matrices.

The test firms consisted of a sample of 340 NYSE firms for which appropriate security return data was available on the CRSP tape. The descriptive statistics on translation methods and exchange adjustments were based on these 340 firms. A reduced sample of 281 MNC, that met the fiscal year ending requirements and had non-zero exchange adjustments in at least one of the test periods, were used in all the statistical tests. The control sample consisted of 281 domestic firms which were generally in the same industry as the test firms.

For testing, firms were grouped into portfolios in six different ways. Test firms were primarily grouped in each test period by the three translation methods used. Additional variables that were used for partitioning were "change in exchange adjustment," magnitude of foreign revenues and "sign of exchange adjustment," in grouping scheme 2, 3, and 4 respectively. In the fifth grouping scheme, portfolios were formed by the translation method used by firms in the pre-FASB No. 8 period. Grouping scheme 6 consisted of "Action" firms and "No Action" firms. Action firms consisted of MNC in which managements were judged to have taken action against accounting risk. No Action firms consisted of the remaining MNC.

Four test periods were used in this study: (1) 1973 and 1974, (2) 1974, (3) 1975, (4) 1976. The years 1973 and 1974 were considered the pre-FASB No. 8 period while the years 1975 and 1976 were considered the post-FASB No. 8 period.

Finally, all the test firms were screened by a filter on the materiality of the exchange adjustments as a percentage of net income. A filter of 1% was used for all grouping schemes but tests on groups one and two were repeated with a filter of 4% and 3% respectively.

The effect on the financial structure of firms was tested by comparing four balance sheet accounts (inventory, fixed assets, current liabilities, and long-term debt) and two income statement amounts (revenue and net income), scaled in each case by the total asset level for the test and control firms. Multivariate comparisons on the vector of ratios were made for both time-series and cross-sectional tests and the firms were grouped according to grouping schemes 5 and 6.

Results. The results of these tests were presented and discussed in Chapter IV. The results of all the tests on security returns were summarized in Table 26 and the results of all the tests on financial structure were summarized in Table 29. Both the means and covariance matrices were evaluated in the cross-sectional tests on security returns. The results of the tests on the mean returns were quite clear. For all grouping schemes in all test periods the mean vectors of the test and control firms were not different at the 5% level of significance. This implies that the null hypothesis of no effect due to FASB No. 8 cannot be rejected, as measured by the means of total returns. The results of the univariate t tests show that the portfolio of firms using the current/noncurrent method (Pc) in 1976 had mean returns significantly different from the control firms for grouping schemes 1, 2 and 4, raising the possibility that the returns of these firms were differentially affected in 1976. However, no definite conclusions can be drawn at present from the above results.

The results of the tests on the covariances of total return distributions were mixed. When test firms were grouped by translation method and size of foreign revenues (grouping 3), the covariance matrices of the test and control firms were found to be significantly different in all four test periods. The results of the tests on the other grouping schemes taken as a whole do not allow one to conclude differences between the covariance matrices of the test and control firms. These results are interpreted to signify that some systematic bias correlated with the magnitude of foreign revenues was present, and that the covariance matrices of the test and control firms are not significantly different in any of the four test periods.

From the cross-sectional test, the results of no difference between the security return distributions of the Action and domestic firms was unexpected. Possibly, the marginal effects of managerial actions against accounting risk is negligible on security returns.

In the time-series tests, only the means of the average residual returns were evaluated. The results obtained were conflicting, and depended on how the test firms were grouped. In grouping schemes 1 through 4, in each year a portfolio consisted of firms that were using the same translation method but the composition of the portfolio changed each year. In grouping scheme 5, each portfolio consisted of the same firms each year. The results of the tests on grouping schemes 1 through 4 showed a very strong difference between the average residuals of 1975 and 1976, and a fairly strong difference between the residuals of 1974 and 1975, but there was no difference between the residuals of 1974 and 1976. Based on these results, the inference that follows is that there was a temporary effect on security returns of MNC which reversed itself over 1975 and 1976. The effect was most pronounced in 1976 and weaker in 1975. This effect on security return residuals occurred in the post-FASB No. 8 period and may be the result of its implementation. The results of the tests on residuals for grouping scheme 5, however, were insignificant in all test periods, implying that there was no effect on security return residuals in the post-FASB No. 8 period. At present, no good explanation exists for reconciling the different results obtained for grouping scheme 5 and grouping schemes 1-4. However, this researcher feels that in testing for the effects of a change in accounting method the grouping procedure followed for scheme 5 is more meaningful.

Our overall conclusions about the effects of FASB No. 8 on security price returns are that in general, there have not been any statistically significant effects on security return distributions of MNC in the post-FASB No. 8 period. However, there are some qualifications. Results of tests on grouping schemes 1-4 based on average residuals show a temporary effect on security returns, which was most pronounced in 1976. No satisfactory explanation is provided for these results. Second, there seems to be an uncontrolled variable associated with the magnitude of foreign revenues that is systematically affecting the variance of returns. Third, the results obtained may be confounded due to the effect of joint signals. Two possible joint signals are annual earnings announcements and the effects of currency movements on the security returns of MNC. Fourth, nonsignificant measurable effects on security returns may also be the result of the averaging out of opposing effects on the individual firms in a portfolio. Additionally, noise inherent in the data may have biased the results. Finally, the results are conditional on our having obtained appropriate control firms. In this regard, some firms treated as domestic firms may have had foreign operations. The results suggest that firms included in the No Action group probably have been misclassified.

The results of the cross-sectional tests on the financial structure of firms were insignificant for grouping scheme 5, implying no difference in the balance sheet structure of firms using different translation methods in both the pre and post-FASB No. 8 periods.

However, the cross-sectional comparison of the Action vs domestic firms did show a significant difference in their balance sheet structure in the post-FASB No. 8 period, implying that there was a statistically significant change in the financial structure of the Action firms in the post-FASB No. 8 period.

The results of the time series tests were insignificant for the balance sheet ratios, but were statistically significant for the income statement ratios. The difference in income statement portfolios Pcm and Pmm. The implication is that the income statement accounts of MNC originally using the current/noncurrent and monetary/nonmonetary methods were changed in the post-FASB No. 8 period. The overall conclusion about the effects of FASB No. 8 on the financial structure of MNC is that the financial structure of selected firms (Action firms) has been affected in the post-FASB No. 8 period. However, a more refined methodology and better data are expected to provide more definitive evidence on the effects of FASB No. 8 on the balance ratios was due to sheet structure of MNC.

Future Research. One important topic for future research is the development of a model for measuring the short run effects of currency movements on the economic values of MNC. Second, the reason for the surprising difference between the 1977 returns of MNC and domestic firms that was found should be investigated. Finally, the reason for the systematic bias in the variances of returns associated with the magnitude of foreign revenues should be investigated.

APPENDIX A

QUESTIONNAIRE SENT TO TEST FIRMS

March 13, 1978

The Vice President-Finance

Dear Sir:

Robit Jain, one of our doctoral students, is currently engaged in a major research project (Ph.D dissertation) to determine the management reactions and economic consequences of the Financial Accounting Standards Board's Statement No. 8 - Accounting for Foreign Currency Translations. Your company has been selected from a sample of multinational firms which have to comply with the reporting requirements of FASB 8.

Managements have expressed concern about the impact of FASB 8 on financial statements. Also, representations have been made in the financial press that firms may need to take unnecessary yet costly steps to negate the unfavorable impact on financial statements due to FASB 8.

The result of Mr. Jain's research should provide data which will be presented to the FASB for possible evaluation of the standard. Results will also be provided to participants in the study. In order to make this research possible, your co-operation and participation are needed and will greatly be appreciated.

Would you please have the appropriate person in your office (or the controller's office) fill out the enclosed questionnaire and mail it in the return envelope provided. It should take less than 30 minutes to complete. Your answers to the specific questions asked are essential, if meaningful results are to be obtained. Of course, the information provided by you will be considered as confidential. Only aggregate results will be made public.

Your co-operation and prompt response will be appreciated.

Sincerely,

Dr. John K. Simmons
Director

EFFECTS OF FASB STATEMENT NO. 3

Note: Only aggregate results will be made public.
The data supplied by you will be kept confidential.

Name of Company _____

Address _____

Name of Company Representative _____

Title of Company Representative _____

____ Please check here if you would like a summary of
of the results of the study.

(4) Continued:

	70	71	72	73	74	75	76	77
b. Decrease hedging								
c. Change operating decisions								
d. Other(explain)								

5. Why was action in (3) above taken? Please explain.

6. After FASB Statement No.8:

	Yes	No	N/A
a. Did the company start hedging <u>items</u> that were previously unhedged? (check one:✓)			
b. Did the company stop hedging <u>items</u> that were previously hedged?			
7. Has the <u>method</u> of hedging changed due to :			
a. FASB Statement No. 8?			
b. FASB Statement No. 1?			

8. What were the major changes in (7) above? Please explain.

9. In your opinion, does the translation gain/loss included in income have an impact on the stock prices of your company?

Yes	No	N/A

10. Are managers in your company rewarded or penalized because of the accounting effect of FASB No. 8?

11. Has the company changed the magnitude of it's hedging due to:

	Increase	Decrease	No change	N/A
a. FASB Statement No. 8				
b. FASB Statement No. 1				

(Please indicate approximate \$ levels, in thousands)

B. EXCHANGE ADJUSTMENT INFORMATION.	1973 (000)	1974 (000)	1975 (000)	1976 (000)	1977 (000)
1. Amount of gain/loss from translation of foreign currency statements:					
2. Amount of gain/loss from foreign currency transactions (purchases, sales, debt etc.):					
3. Amount of gain/loss realized from forward exchange contracts:					
4. Amount of unrealised gain/loss on unperformed forward exchange contracts:					
5. The amount of total forward exchange contracts outstanding:					
6. Amount of aggregate exchange gain/loss included in income (as per FASB No. 8):					
7. In your opinion, are the exchange gains/losses included in income material? (Check if <u>yes</u> .)					
C. SELECTED FINANCIAL INFORMATION.					
1. Foreign revenue of company:					
As % of total revenue (approx.):					
2. Foreign assets of company:					
As % of total assets (approx.):					
3. Foreign liabilities of company:					
As % of total liab. (approx.):					
4. Foreign income of company:					
As % of total income (approx.):					

Thank you very much for your participation in this questionnaire. Please mail it in the envelope enclosed.

APPENDIX B

SUMMARY RESULTS OF QUESTIONNAIRE: RESPONSE TO SELECTED QUESTIONS

TOTAL RESPONSE = 100 FIRMS

RESPONSE	YEAR							
	1970	1971	1972	1973	1974	1975	1976	1977
Question 2:								
<u>Principal method used to protect against foreign exchange risk.</u>								
a.(leads & lags in trade)	5	5	8	9	9	8	9	8
b.(forward exchange contracts)	15	14	12	14	17	18	21	22
c.(operating decisions)	6	6	6	7	8	7	6	6
d.(no hedging used)	33	34	33	31	28	28	25	26
e.(other methods)	6	6	6	6	5	5	5	5
local financing	5	5	5	5	5	4	4	4
b. & e.	3	3	3	4	4	5	4	6
a. & b.	1	1	3	3	3	4	4	3
a. & b. & e.	-	-	-	-	-	-	1	2
c. & d.	2	2	2	2	2	3	3	3
b. & c.	1	1	1	1	1	2	2	1
a. & b. & c.	2	2	2	3	3	3	3	3
d. & e.	1	1	1	1	1	1	1	1
a. & c.	-	-	-	-	-	1	1	1
b. & e.	1	1	1	-	-	-	-	-
b. & local financing	-	-	-	-	-	-	1	1
no response	19	19	17	14	14	11	10	8
Question 3:								
<u>Has the company taken action to cover accounting exposure?</u>								
yes	6	5	5	6	6	11	16	24
no/no-response	94	95	95	94	94	89	84	76
Question 4:								
<u>What type of action was taken in (3) above?</u>								
a.(increase hedging)	4	4	4	5	6	7	9	13
b.(decrease hedging)	-	-	-	-	-	1	-	-
c.(change operating decisions)	1	1	1	1	1	5	6	6
d.(other action)	1	1	1	1	1	1	1	2
a. & d.	-	-	-	-	-	-	1	1
a. & b.	-	-	-	-	-	1	2	2
no response	94	94	94	93	92	85	81	76

QUESTION	RESPONSE			
	Yes	No	N/A	No Resp.
No. 6a: Did you start hedging items that were previously unhedged?	21	64	11	4
No. 6b: Did you stop hedging items that were previously hedged?	5	63	22	10
No. 7a: Has the method of hedging changed due to FASB Statement No. 8?	13	64	17	6
No. 7b: Has the method of hedging changed due to FASB Statement No. 1?	2	70	16	12
No. 9: In your opinion, does the translation gain/loss included in income have an impact on the stock prices of your company?	36	51	4	6
No.10: Are the managers in your company rewarded or penalised because of the accounting effect of FASB Statement No. 8?	18	71	7	4

	RESPONSE				
	<u>Increase</u>	<u>Decrease</u>	<u>No change</u>	<u>N/A</u>	<u>No Response</u>
No.11a: Has the company changed the magnitude of it's hedging due to FASB Statement No. 8?	18	3	64	12	3
No. 11b: Has the company changed the magnitude of it's hedging due to FASB Statement No. 1?	--	--	80	13	7

APPENDIX C
LISTING OF THE 340 FIRMS
INCLUDED IN THE TEST SAMPLE

A. C. F. Inds. Inc.	Borden Inc.
A. M. F. Inc.	Borg Warner Corp.
A. T. O. Inc.	Bristol Myers Co.
Abbott Labs	Brunswick Corp.
Addressograph Multigraph Corp.	Bucyrus Erie Co.
Airco Inc.	Burlington Inds. Inc.
Alberto Culver Co.	Burroughs Corp.
Allied Chem. Corp.	Cabot Corp.
Allis Chalmers Corp.	Campbell Soup Co.
Aluminum Co. Amer.	Carborundum Co.
Amax Inc.	Carling Okeefe Ltd.
American Air Filter Inc.	Carrier Corp.
American Brands Inc.	Castle & Cooke Inc.
American Can Co.	Caterpillar Tractor Co.
American Cyanamid Co.	Celanese Corp.
American Hoist & Derrick Co.	Central Soya Inc.
American Home Prods. Corp.	Champion Intl. Corp.
American Hosp. Supply Corp.	Champion Spark Plug Co.
American Seating Co.	Chemetron Corp.
Amp Inc.	Chesebrough Ponds Inc.
Anaconda Co.	Chicago Pneumatic Tool Co.
Anderson Clayton & Co.	Chromalloy Amern. Corp. Del.
Archer Daniels Midland Co.	Chrysler Corp.
Armco Stl. Corp.	Cities Svc. Co.
Armstrong Cork Co.	Clark Equip. Co.
Asarco Inc.	Clorox Co.
Ashland Oil Inc.	Cluett Peabody & Co. Inc.
Avco Corp.	Coca Cola Co.
Avery Intl. Corp.	Colgate Palmolive Co
Avon Prods. Inc.	Colt Inds. Inc. Del.
Bausch & Lomb Inc.	Combustion Engr. Inc.
Baxter Travenol Labs Inc.	Conrac Corp.
Beatrice Foods Co.	Consolidated Foods Corp.
Becton Dickinson & Co.	Continental Corp
Belco Pete. Corp.	Continental Group Inc.
Bell & Howell Co.	Continental Oil Co.
Bendix Corp.	Control Data Corp. Del.
Beneficial Corp.	Cooper Inds. Inc.
Black & Decker Mfg. Co.	Copeland Corp.
Blue Bell Inc.	Corning Glass Wks.
Boise Cascade Corp.	Crane Co.

Crown Cork & Seal Inc.	General Tire & Rubr. Co.
Crown Zellerbach Corp.	Genesco Inc.
Culligan Intl. Co.	Gerber Prods. Co.
Cummins Engine Inc.	Getty Oil Co.
Curtiss Wright Corp.	Giddings & Lewis Inc.
Cyprus Mines Corp.	Gillette Co.
Dana Corp.	Goodrich B. F. Co.
Dart Inds. Inc.	Goodyear Tire & Rubr. Co.
Dayco Corp.	Gould Inc.
Deere & Co.	Grace W. R. & Co.
Del Monte Corp.	Great Atlantic & Pac. Tea Inc.
Dexter Corp.	Green Giant Co.
Di Giorgio Corp.	Greyhound Corp.
Dillingham Corp.	Grolier Inc.
Dow Chem. Co.	Gulf Oil Corp.
Dravo Corp.	H. M. W. Inds. Inc.
Dresser Inds. Inc.	Halliburton Co.
Du Pont E. I. De Nemours & Co.	Harris Corp. Del.
Eastman Kodak Co.	Harsco Corp.
Eaton Corp.	Heinz H. J. Co.
Emerson Elec. Co.	Hercules Inc.
Engelhard Minerals & Chems. Corp.	Hershey Foods Corp.
Esmark Inc.	Heublein Inc.
Ethyl Corp	Hewlett Packard Co.
Evans Prods. Co.	Hobart Corp.
Ex Cell O Corp.	Holiday Inns Inc.
Exxon Corp.	Honeywell Inc.
F. M. C. Corp.	Houston Nat. Gas Corp.
Faberge Inc.	I. C. Inds. Inc.
Fairchild Camera & Instr. Corp.	I. C. N. Pharms. Inc.
Farah Mfg. Inc.	I. U. Intl. Corp.
Federal Mogul. Corp.	Ingersoll Rand Co.
Ferro Corp	Inmont Corp.
Flintkote Co.	Insilco Corp.
Fluor Corp.	Interlake Inc.
Footo Cone & Belding Comctns. Inc.	International Harvester Co.
Ford Mtr. Co. Del.	International Minerals & Chem.
Foster Wheeler Corp.	International Paper Co.
Fruehauf Corp.	International Rectifier Corp.
Fuqua Inds. Inc.	International Tel. & Teleg. Corp.
G. A. F. Corp.	Itek Corp.
G. A. T. X. Corp.	Johns Manville Corp.
Gamble Skogmo Inc.	Johnson & Johnson
Gardner Denver Co.	Jonathan Logan Inc.
General Denver Co.	Joy Mfg. Co.
General Cable Corp.	Kaiser Alum. & Chem. Corp.
General Dynamics Corp.	Katy Inds. Inc.
General Elec. Co.	Kawecki Berylco Inds. Inc.
General Foods Corp.	Kellogg Co.
General Mls. Inc.	Kennametal Inc.
General Mtrs. Corp.	Kerr McGee Corp.
General Refractories Co.	Koehring Co.
General Signal Corp.	Kraft Inc.

Lear Siegler Inc.
 Libby McNeill & Libby
 Lilly Eli & Co.
 Litton Inds. Inc.
 Lone Star Inds.
 Lubrizol Corp.
 M. C. A. Inc.
 Masco Corp.
 Massey Ferguson Ltd.
 Mc Graw Edison Co.
 Mead Corp.
 Merck & Co.
 Midland Ross Corp.
 Miles Labs Inc.
 Minnesota Mng. & Mfg. Co
 Mobil Corp.
 Mohasco Corp.
 Monsanto Co.
 Morton Norwiche Prod. Inc. Del.
 Motorola Inc.
 Murphy Oil Corp.
 N. C. R. Corp.
 N. L. Inds. Inc.
 Nabisco Inc.
 Nalco Chem Co.
 Nashua Corp.
 National Can Corp.
 National Distillers & Chem. Corp.
 National Starch & Chem. Corp.
 Neptune Intl. Corp.
 Newmont Mng. Corp.
 Norris Inds. Inc.
 Norton Co.
 Norton Simon Inc.
 Occidental Pete. Corp.
 Ogden Corp
 Olin Corp.
 Omark Inds. Inc.
 Outboard Mariene Corp.
 Owens Corning Fiberglas Corp.
 P. P. G. Inds. Inc.
 Parker Hannifin Corp.
 Parker pen Co.
 Penney J. C. Inc.
 Pennwalt Corp.
 Pepsico Inc.
 Perkin Elmer Corp.
 Pfizer Inc.
 Philip Morris Inc
 Phillips Pete. Co.
 Pitney Bowes Inc.
 Polaroid Corp.
 Portec Inc.

Products Resh. & Chem. Corp.
 Pullman Inc.
 Purex Corp.
 Puolator Inc.
 Quaker St. Oil Refng. Corp.
 Questor Corp.
 R. C. A. Corp.
 Ralston Purina Co.
 Ranco Inc.
 Raybestos Manhattan Inc.
 Raymond Intl. Inc.
 Raytheon Co.
 Reliance Elec. Co.
 Revlon Inc.
 Rexnord Inc.
 Reynolds R. J. Inds. Inc.
 Reynolds Metals Co.
 Richardson Merrell Inc.
 Robertson H. H. Co.
 Rockwell Intl. Corp.
 Rohm & Haas Co.
 Ronson Corp.
 S. C. M. Corp.
 Safeway Stores Inc.
 St. Joe Minerals Corp.
 St. Regis Paper Co.
 Sanders Assoc. Inc.
 Schering Plough Corp.
 Scott Paper Co.
 Scovill Mfg. Co.
 Seagram Ltd.
 Searle G. D. & Co.
 Sears Roebuck & Co.
 Sherwin Williams Co.
 Signal Cos Inc.
 Signode Corp.
 Simmons Co.
 Singer Co
 Smith A. O. Corp.
 Smithkline Corp.
 Sperry Rand Corp.
 Square D. Co.
 Squibb Corp.
 Staley A. E. Mfg. Co.
 Standard Brands Inc.
 Standard Oil Co. Calif.
 Standard Oil Co. Ind.
 Stanley Wks.
 Starrett L. S. Co.
 Stauffer Chem Co.
 Sterling Drug Inc.
 Stewart Warner Corp.
 Stokely Van Camp Inc.

Studebaker Worthington Inc.
Sunbeam Corp. Del.
Sundstrand Corp.
Superior Oil Co.
Sybron Corp.
T. R. W. Inc.
Talley Inds. Inc.
Texaco Inc.
Texas Instrs. Inc.
Texasgulf Inc.
Textron Inc.
Thomas & Betts Corp.
Timken Co.
Trane Co.
Trans Un. Corp.
Transamerica Corp.
U. A. L. Inc.
U. V. Inds. Inc.
Union Carbide Corp.
Union Oil Co. Calif.
United Brands Co.
United Mwechants & Mfrs. Inc.
United Sts. Inds. Inc.
United Sts. Stl. Corp.
Universal Leaf Tob. Inc.
Upjohn Co.
Varian Assoc. Inc.
Vendo Co.
Walker Hiram Gooderham & Worts
Wallace Murray Corp.
Walter Jim Corp.
Warnaco Inc.
Warner Lambert Co
Westinghouse Elec. Corp.
Westvaco Corp.
Weyerhaeuser Co.
White Cons Inds. Inc.
White Mtr. Corp.
Whittaker Corp.
Wickes Corp.
Williams Cos
Witco Chem Corp.
Wrigley Wm. Jr. Co.
Xerox Corp.
Zapata Corp
Zenith Radio Corp.

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